National Defence

EME journal

summer 1985

FOCUS ON DCGEM

Canada

EME JOURNAL

The EME Journal is the magazine of the Land Electrical and Mechanical Engineers, published at NDHQ under the terms of reference of the Director General Land Engineering and Maintenance and the LEME Branch Adviser. The purpose of the publication is to disseminate professional information among members, and exchange opinions, ideas, experience and personnel news, and promote the identity of the LEME Branch.

The EME Journal depends upon its readers for content. Articles on al aspects of the Electrical and Mechanical Engineering System, photographs, cartoons, people news and comments are solicited. Readers are reminded that the Journal is an unclassified and unofficial source of information. The contents do not necessarily represent official DND policy and are not to be quoted as authority for action.

Contributors are asked to submit the original text typewritten, double spaced, paper size as herein. Photos should be sharp, glossy, black and white prints with captions typed separately. Personnel should be identified in all cases, both text and captions, by rank, initials, surname, trade and unit.

Send correspondence to:

National Defence Headquarters
Director Land Engineering Support
Ottawa, Ont.
K1A 0K2

Editor-in-chief	*BGen JGR Doucet, CD*
Editor	*Col MAC Campbell, CD*

Associate Editors

FMC	*LCol RJ Vincent, CD*	*202 WD*	*LCol JAY St Laurent, CD*
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FROM THE DIRECTOR GENERAL LAND ENGINEERING AND MAINTENANCE AND LEME BRANCH ADVISER

Brigadier General J.G.R. Doucet CD

As promised in the LEME Branch Information Letter of 28 September 1984, I have directed that "The Trade Advisers' Corner" become a permanent feature of the EME Journal. My aim is twofold — first to ensure wide dissemination of information concerning trade updates and Trade Advisory Committee activities, and secondly, to provide a forum through which individual technicians can express their concerns to the Branch as a whole. I don't promise that all individual concerns will be published in the Journal but I do promise that every technician concerned enough to forward his or her concerns to the Editor will receive a formal reply.

To set the scene for "The Trade Advisers' Corner", a brief explanation of the Trade Advisory System is in order. In accordance with CFAO 4-11, I, as Branch Adviser, have a responsibility to advise the NDHQ Personnel Group on LEME Branch identity matters and as well must keep abreast of training and personnel matters affecting each of the LEME trades. My capacity in this regard is advisory only and as such I cannot unilaterally direct the implementation of new personnel policies nor can I direct Command or Unit Headquarters to do so. My recommendations however do influence policy and as such it is very important that I maintain an in-depth and current knowledge of all Branch and trade matters. To assist me in doing this I have appointed a senior officer to represent each of the four generic LEME Trades (Vehicles, Weapons, Fire Control Systems, and Materials). Each Trade Adviser in turn appoints a senior trade representative, usually a CWO or MWO, to be the Trade Adviser Assistant and establishes a Trade Advisory Committee composed of trade representatives from each of the Commands and major units and key NDHQ trade representatives eg career managers, LCMMs, etc. Each Trade Advisory Committee must meet at least once a year to discuss trade issues and concerns but can meet more frequently at the discretion of the respective Trade Adviser. Following each meeting the Trade Adviser will refer concerns to the responsible authority as necessary with information copies to me as Branch Adviser.

The system as explained above, sounds simple, but can only work effectively if a two-way flow of information is generated ie technicians must relay their concerns to their Trade Advisory Committee representatives for discussion at TAC meetings and the Trade Adviser must in turn relay the results of those discussions to the field. In the past, despite good efforts on the part of all individuals concerned, I don't think we, as a Branch, have been too successful in uplining concerns and/or in disseminating information about collective concerns to all trade members. The reason for this lack of success is that there was no medium through which to relay this information. I hope and believe that the establishment of this "Trade Advisers' Corner" will correct that deficiency. Let's use it and see. Letters should be addressed as follows:

Editor, EME Journal
National Defence Headquarters
Director Land Engineering Support
Ottawa, Ont.
K1A 0K2

All letters must be signed by the originator stating rank and Unit.

For information, current Trade Advisers and Assistants are as follows:

411 (Vehicles), LCol RP Britt, CWO WO Goundry.
421 (Wpns), LCol JP Dagenais, CWO HM Stevens.
430 (FCS), Col LA Leflar, CWO RM Northrup.
441 (Materials), LCol TF Lydon, CWO R. Landry.

The names of other TAC members will be published in the next EME Journal after the 1985 APS period.

FOCUS ON DCGEM - AN OVERVIEW

by P.L. Marsh

Mr. P.L. Marsh, PEng, Director.

INTRODUCTION

The Directorate of Clothing General Engineering and Maintenance (DCGEM) came into being in 1945 as the Directorate of Interservice Research and Development. With the formulation of the Defence Research Board in 1946, the Directorate dropped the research appellation and became the Directorate of Interservice Development (DID). The key word is 'Interservice', for DID had tri-service responsibilities from its inception and this has not changed in its years of existence.

Prior to Canadian Forces integration in the 1960's, the Directorate was responsible for the design and development of textiles, clothing, footwear, tentage, personal equipment, sleeping gear, oversnow equipment and a large group of general stores items. The reorganization associated with integration resulted in the Directorate being assigned additional responsibilities for materials, ration systems, food preparation equipment, material preservation and containers. It was re-designated Directorate of Clothing and General Engineering (DCGE) in 1965.

In 1973, the associated maintenance functions were passed to DCGE. At that time, not only were the maintenance aspects of the existing assigned product areas added to DCGE (now DCGEM), a new range of items were also transferred to the Directorate. This range covered approximately 250 stock classes comprising hundreds of thousands of individual items.

Roles and Organization

The Director of Clothing, General Engineering and Maintenance is accountable for the planning and execution of Life Cycle Management for a very wide and diverse range of items, components, equipments and systems for the Canadian Forces, including all types of operational and non-operational clothing; materials; tents and shelters; personal life support equipment; heating and cooking equipment; workshop machinery and tools; protection and preservation of tactical equipment; camouflage equipment and NBCW protective, decontamination and detection equipment. These can be peculiar to navy, army or airforce, but many of these product areas are in the common user category. He is also accountable for the management of in-house design and prototyping facilities and for the international standardization interchangeability and technical exchange activities in these areas.

DCGEM reports to the Director General Land Engineering and Maintenance. There are four sections reporting to the Director, as follows:

DCGEM 2 – Clothing and Textiles Section, which is responsible for the Life Cycle Management, including technical and development control, of all operational, protective, dress and ceremonial clothing, footwear and handwear, CW casualty evacuation equipment, badges and regalia, ballistic and NBCW protection of the individual and all textile materials and their applications.

DCGEM 3 – General Engineering, Material, Tools and Equipment Section, which is responsible for the Life Cycle Management, including technical and development control, of workshop equipment and tools; tactical equipment protection and preservation; furniture and appliances; miscellaneous hardware; coatings, chemicals, paint, POL and rubber and polymers; kitchen, servery and food preparation equipment; firefighting and safety equipment.

DCGEM 4 – Combat Support Equipment and Services Section, which is responsible for the Life Cycle Management, including technical and development control of tents and shelters including CW collective protection aspects; individual and group operational equipment; life jackets and devices; camouflage equipment; tests and trials on all DCGEM commodities; directorate planning and coordination.

DCGEM 5 – Nuclear, Biological and Chemical Defence Systems, which is responsible for the Life Cycle Management, including technical and development control of chemical defence, training equipment and decontamination; radiac equipment; radiation safety; chemical protection and decontamination.

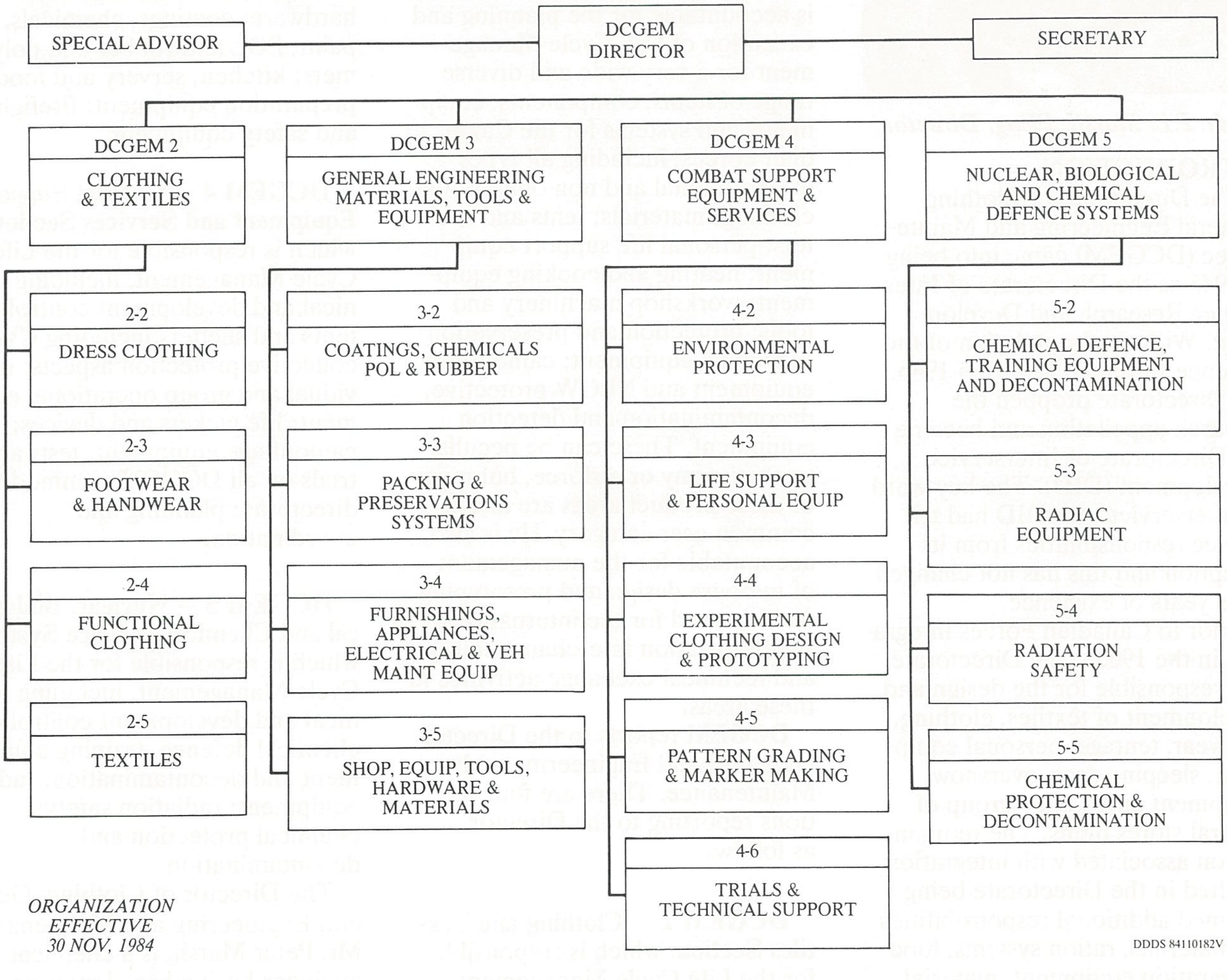
The Director of Clothing, General Engineering and Maintenance, Mr. Peter Marsh, is a chemical engineer having broad management and engineering experience in both the public and private sectors. A graduate from the universities of Birkenhead and Salford, Mr. Marsh worked for ten years in the research and development of heavy chemicals and fuel additives for a company (Associated Otel Co. Ltd.) in the United Kingdom, followed by manager of design department Manesty Machines Ltd., high precision mechanical equipment.

In 1967, Mr. Marsh emigrated to Canada to accept a position as Chief of the design team for a major chemical plant. On completion of the design phase, he was responsible for the commissioning and start-up of the plant, which is situated near Windsor, Ontario.

In 1970, Mr. Marsh moved to Newfoundland to take the position of Divisional Manager of Engineering Services with the Electric Reduction Company of Newfoundland. After serving three years with this company, he joined the Federal Public Service in the National Capital in the employment of Environment Canada. His assignment involved working with Canadian industry and all provincial government on air pollution problems. He began his service in DND in June 1976 as Section Head, General Engineering Tools and Equipment, DCGEM. He was appointed to his present position in the summer of 1984.

Mr. Marsh is married and has two daughters and a son.

DIRECTORATE OF CLOTHING GENERAL ENGINEERING AND MAINTENANCE DEPARTMENT OF NATIONAL DEFENCE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TRIALS & TECHNICAL SUPPORT
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NUCLEAR, BIOLOGICAL AND CHEMICAL DEFENCE SYSTEMS
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CHEMICAL PROTECTION & DECONTAMINATION

ORGANIZATION EFFECTIVE 30 NOV, 1984

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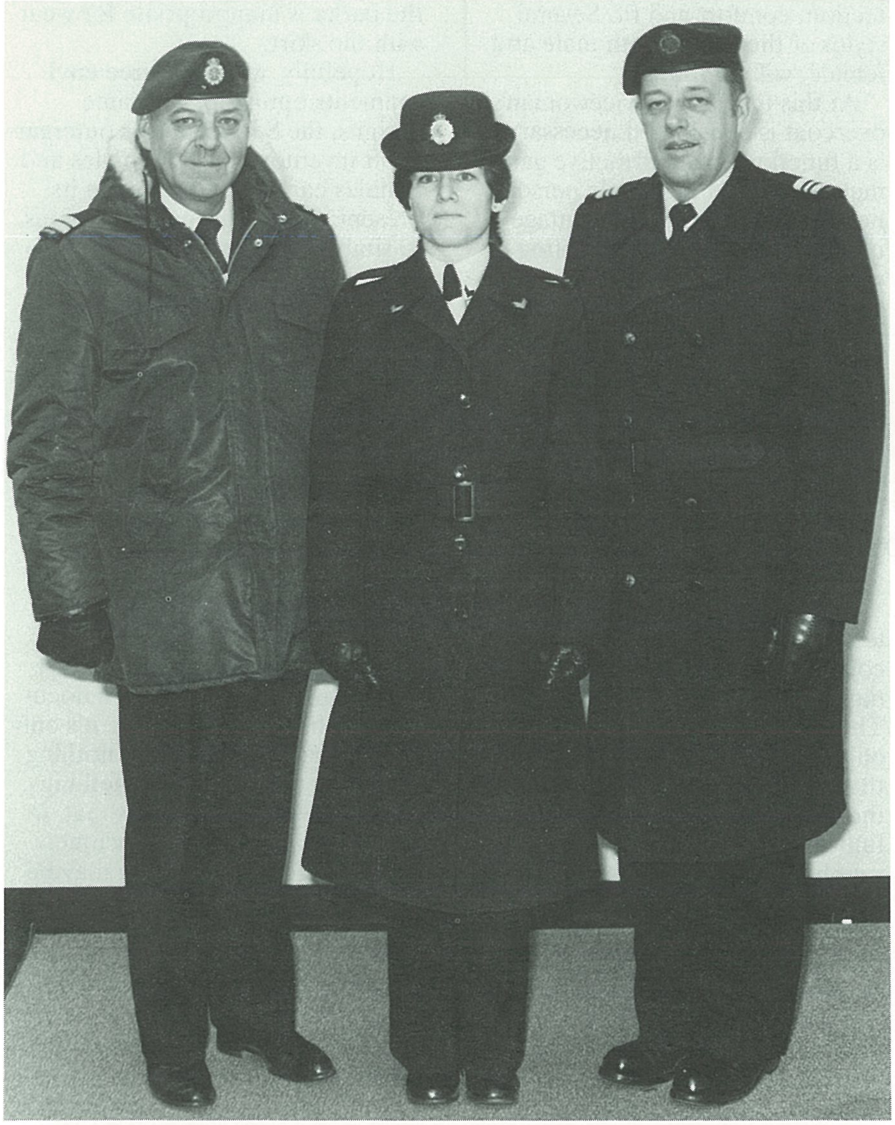
THE NUMEROUS CF OUTERGARMENTS or I NEED A LARGER CLOSET

by M.L. Capstick



Left: Capt D. Morden wearing current optional Canex Parka. Centre: Cpl S.E. Hannan wearing Style A trial topcoat. Right: Maj T. Kodikoff wearing Style A trial topcoat.

With overcoats, topcoats, raincoats, windbreakers and parkas currently authorized for wear with S 3's and FS 3's it is no wonder that the National Defence Clothing and Dress Committee (NDCDC) is taking a serious look at dress outergarments. At a 1982 meeting of the NDCDC Procurement Planning Sub-Committee it was agreed that there was a need to rationalize the clothing inventory. The net result is unlikely to be a reduction — the aim was to provide a better system of outerwear that would provide for all seasons.

An attempt is being made to develop a system of outerwear that more adequately caters to seasonal requirements and at the same time increases the appearance and functional suitability of the items. As the return to three distinctive environmental colours triples clothing requirement, any action to reduce garments is timely.

One item being considered for deletion is the male overcoat. Many users consider it to be impractical, uncomfortable and functionally unsuitable. However, the overcoat is the most expensive item of CF dress clothing. If its retention is essential for ceremonial purposes then it may be prudent to consider other options such as issue on loan when needed.

DCGEM was tasked to develop viable alternative outergarments, and responded with two concepts for the consideration of the committee:

A. The modification of the gabardine topcoat to incorporate an insulating liner, thereby extending its wearability; and

B. The provision of a suitable dress parka to eliminate the current Canex version.

Although the Canex parka is a popular item with the user, it fails to provide an appropriate dress uniform appearance, its cold weather protection capabilities are limited, and with its present optional procurement status, it is far from uniform in appearance.

An engineering trial is currently being conducted on the modified topcoat to determine the acceptability of its appearance, environmental protection, comfort and fit. Two styles each of the male and female topcoats are being trialed:

1) Style A — Visible button/buttonhole front closure belt and belt loops with removable liner (male garment is double

breasted, female garment is single breasted).
2. Style B — Front fly closure, without belt, with removable liner.

A total of one hundred and sixty male and one hundred and twenty female service personnel are participating in the trial, at the following locations:

CFB Montreal
CFB Borden
CFB Winnipeg
CFB Halifax
NDHQ and CFB Ottawa

In order to maintain ease of logistics, four sizes only of each style were provided. Care was therefore taken to ensure trial participants were selected on the basis of the most satisfactory fit, and care was also taken to ensure there was an adequate representation of both Officers and Other Ranks.

The designs for the dress parka are currently being finalized, and will be trialed winter 85/86 to assess their suitability in providing a satisfactory dress uniform appearance, environmental protection, comfort and fit. Several styles of the parka, both male and female, will be trialed.

At this time the servicewoman's overcoat is considered necessary. It is a functional and attractive garment well liked by female personnel with only a small percentage of the female population opting to wear the Canex Parka. In addition, the female overcoat is required for cold weather protection when wearing the service dress skirt. To delete the female overcoat in lieu of the topcoat and parka could possibly result in servicewomen only being able to wear their service dress slacks during the winter months, as the current topcoat cannot be expected to provide sufficient environmental protection and the parka is inappropriate for wear with the skirt.

Hopefully, with the three environments opting for the same designs, the Service Dress outergarment inventory for both males and females can be reduced from its present closet stuffing proportions to simply: topcoat (with liner), raincoat and parka. The colours however, well, that's another story . . .!

INTRODUCTION OF USER ORIENTED PACKAGING WITH AN AIM TO PLEASE

by J.R. Reeves, DCGEM 3-3

A former colleague, who heads a packaging research and testing laboratory in the U.S.A., was relating a story about a child-resistant packaging test program that was so common in the 70's. A five year old girl was given a jar of candy secured by a prototype child-proof closure with the promise that the candy was hers if she could open the jar. The child struggled with the closure for a few seconds, then flung it to the floor exclaiming: 'I can't open the d . . . thing!' The supervisor scolded the child on her use of language and the child, with widening and innocent little eyes, replied: 'But, that's what mommy does when she can't open them.'

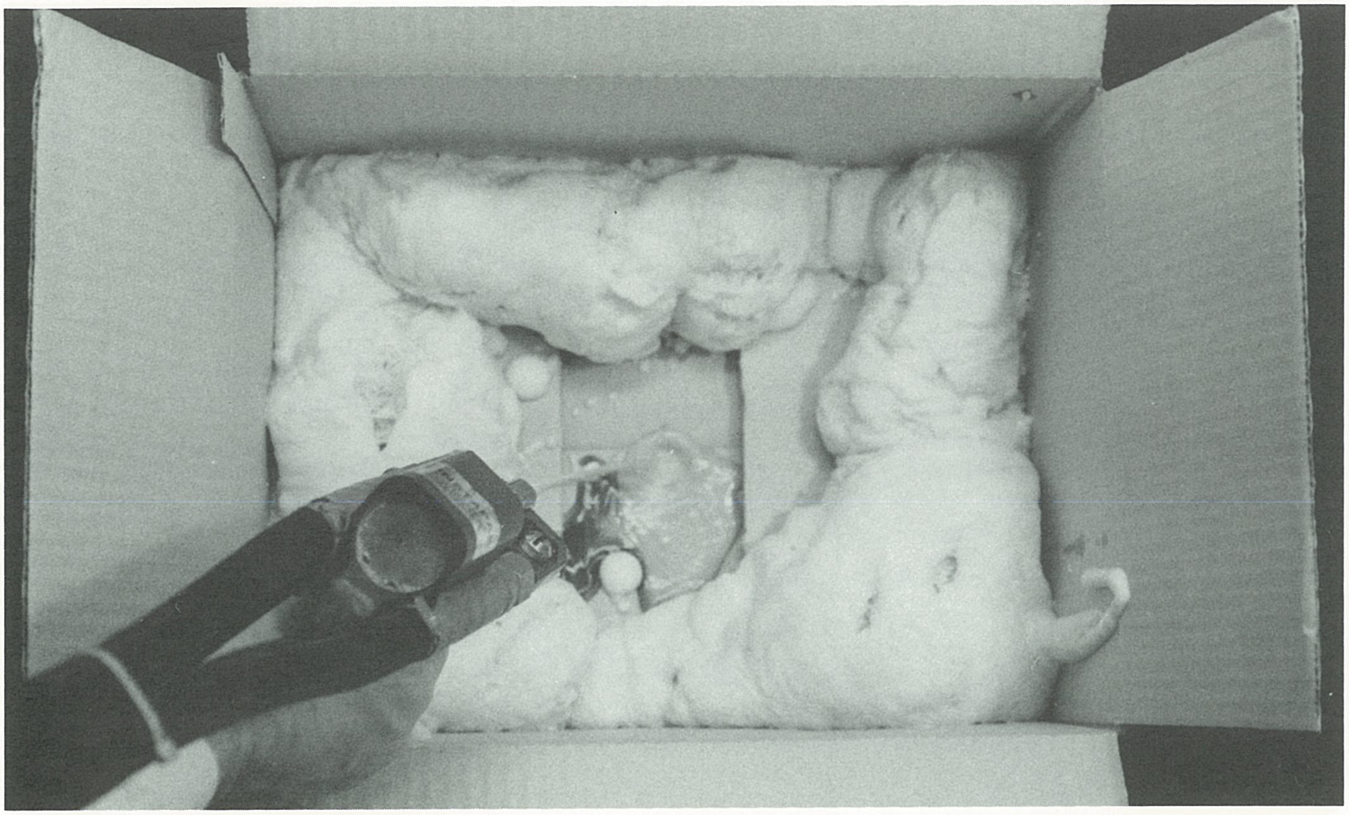
I wonder if we sometimes package the same way in the Canadian Forces. Do we design and provide soldier-proof packaging? In July 1982, I received a UCR claiming, in part, that it takes a tank crew up to 8 hours to bomb-up because of impregnable packaging. The UCR also referred to camouflage and litter problems caused by spent packaging. There has to be a better way, it was claimed.

There may be at least two, and tests and successful user trials were conducted with both these potentially improved delivery systems. The problem was addressed, but only because it was identified. Was this an isolated incident or are there other areas where we blissfully and gleefully design and supply soldier-proof packaging?

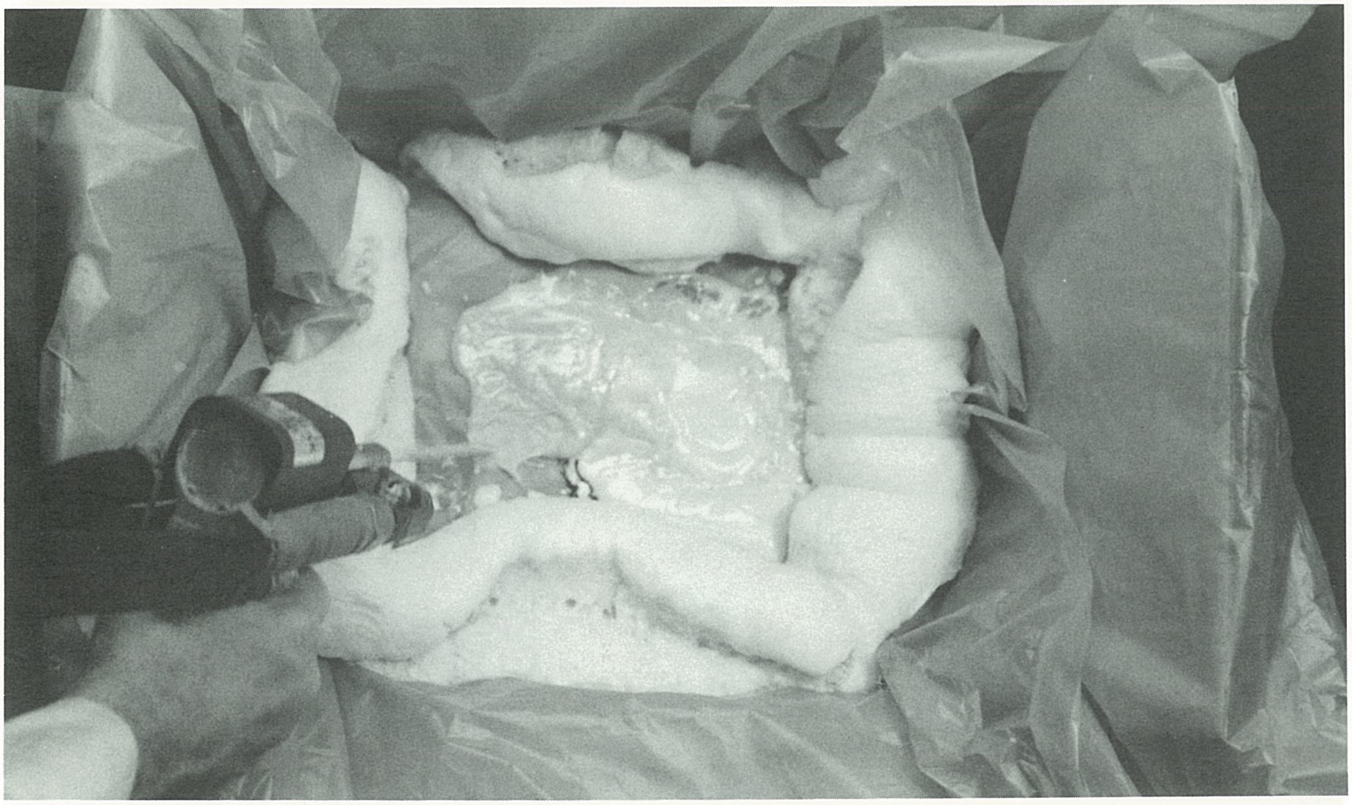
On the other hand, do we sometimes provides woefully inadequate packaging? Do we spend dollars on maintenance and repair to save pennies on packaging? I have sympathized with maintenance technicians at two Canadian Forces bases who were sandblasting and removing rust from carburetors, or distributors, or something. They were complaining that these repaired items would go back on the shelf unpackaged, and in six months time, will be back again, full of rust, for repairs.

Is this true? Are these isolated incidents or is this commonplace? It has not been documented, at least not to my knowledge. Does the problem, therefore, not exist? I doubt that, for I have seen everything from nuts to bolts to brand new Leopard tank gun barrels exposed to the elements and rusting. Perhaps it has not been documented because of apathy; it's only packaging; that's life, and nothing can be done about it. Something *can* be done about it if it's real, if it's identified and if it's documented. The proper packaging may be expensive, but just as likely, may not. The maintenance techs with the rust problems may only require a commercial plastic freezer bag, a twist-tie and a rust inhibiting capsule; a $2.00 packaging solution to a $60.00 a year maintenance problem. An even simpler solution may be a cold sealing, rust inhibiting grade of plastic bag.

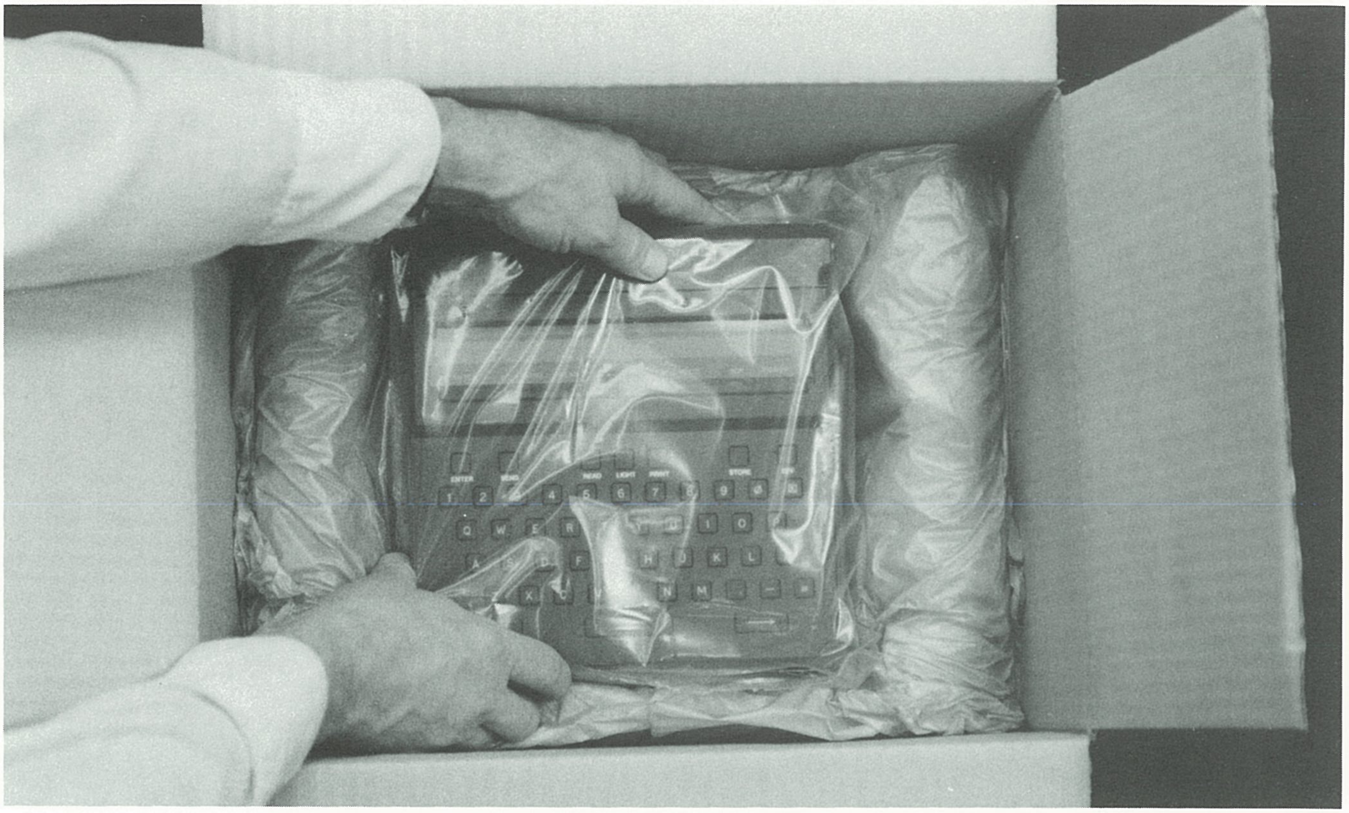
There are about as many packaging solutions as there are packaging problems, although the Canadian Forces are somewhat unique. We are in general, small-volume packagers of a large number of inventory items. We do not package 20,000 litre bags of milk per day and therefore we cannot afford that specialized and dedicated packaging machinery. There are,



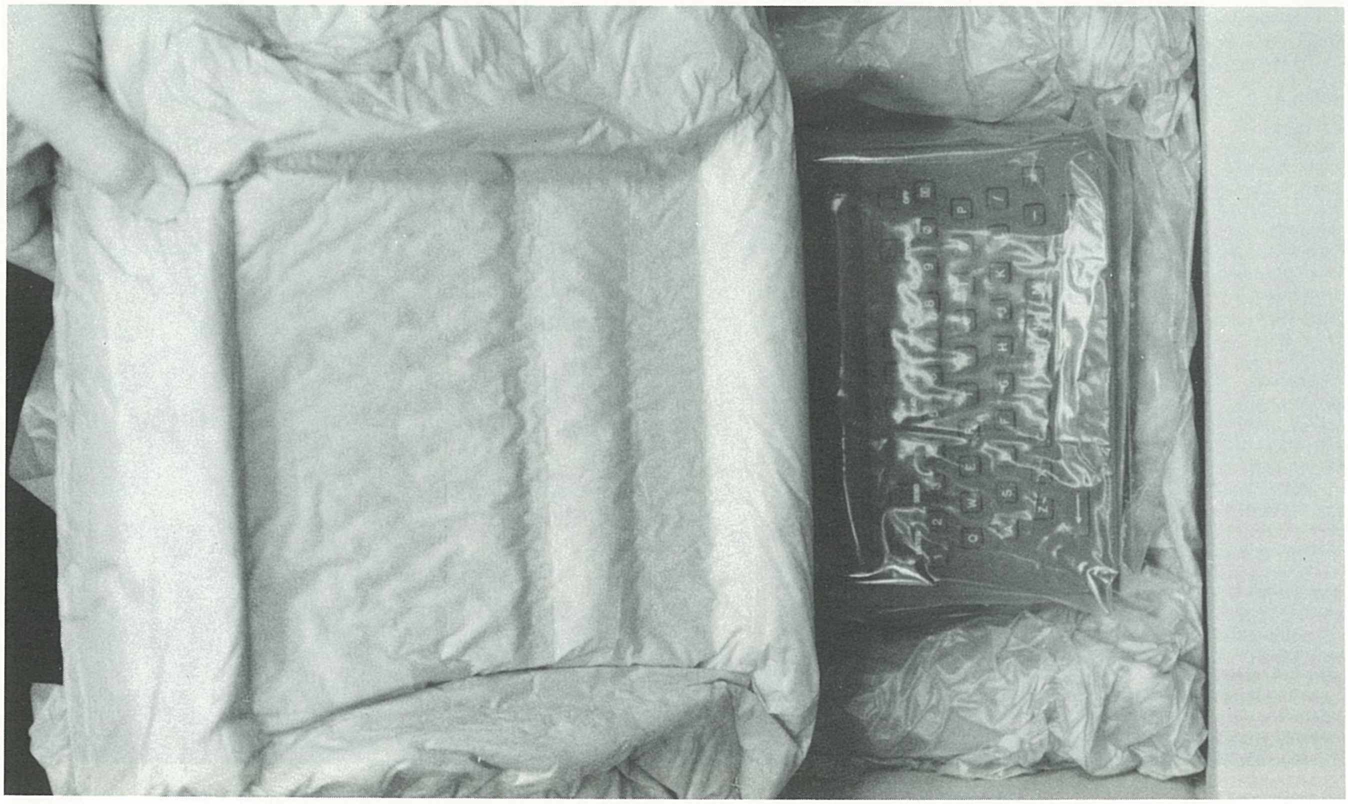
Liquid urethane and a foaming catalyst is dispensed into the bottom of a corrugated box.



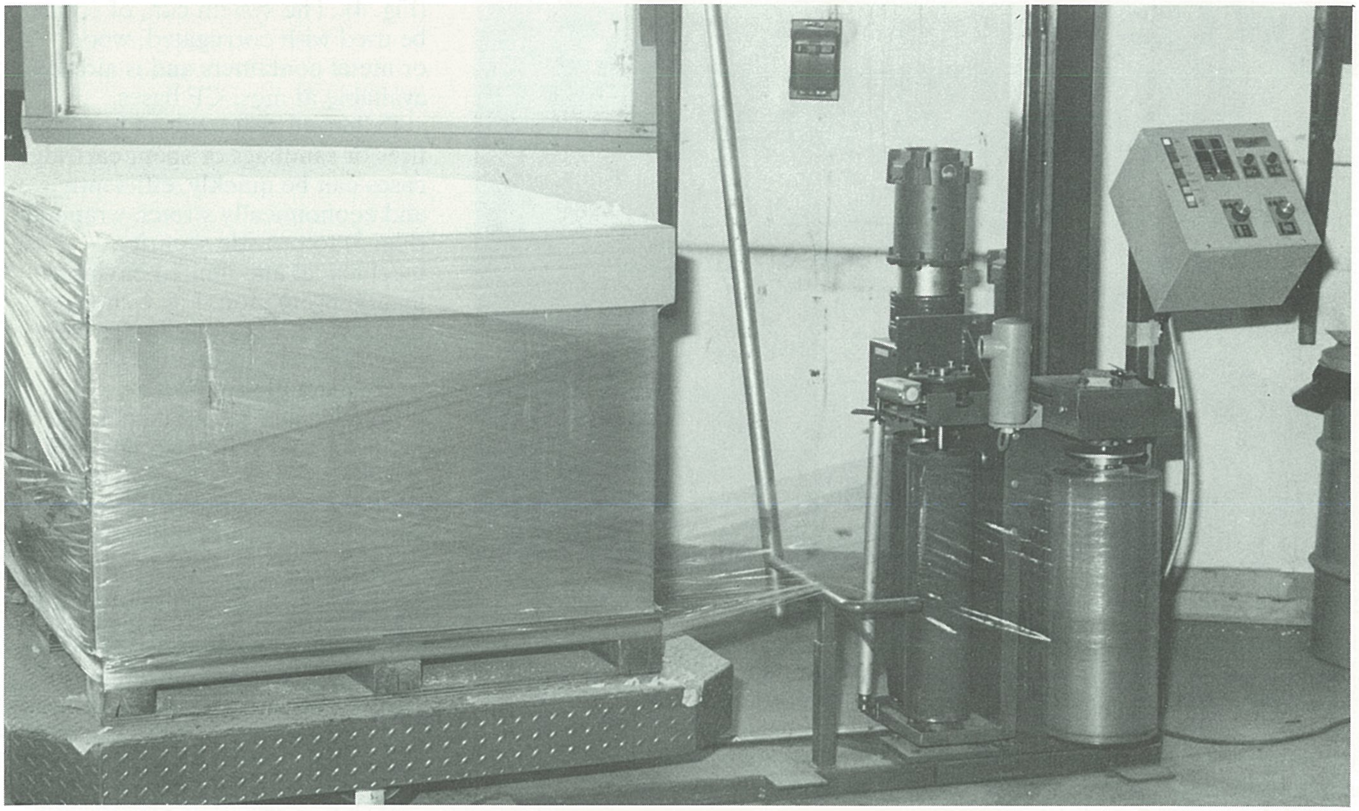
Additional film and foam is dispensed over the product filling the box with foam. The box is then sealed and is ready for shipment.



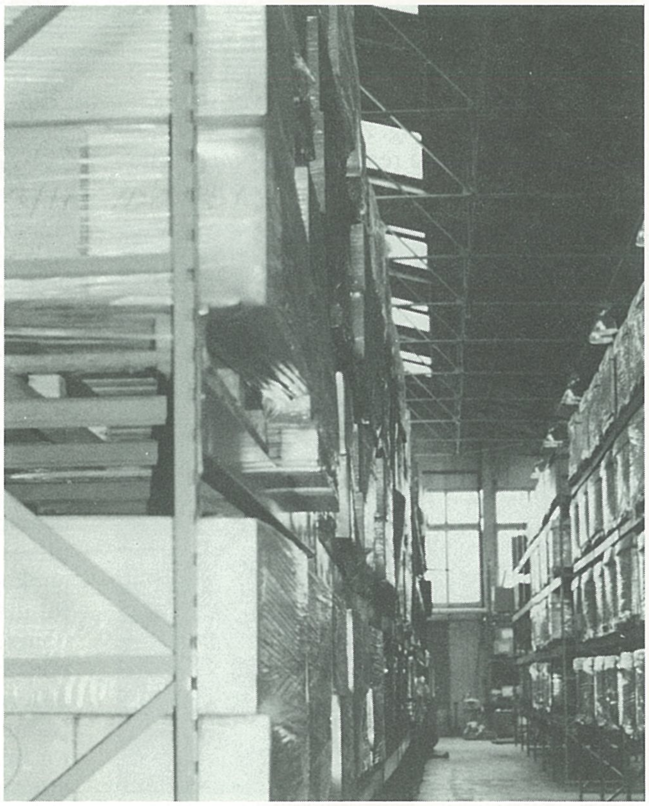
A sheet of plastic film and the product to be protected is placed over the rising foam. For additional protection, this product was wrapped in anti-static film.



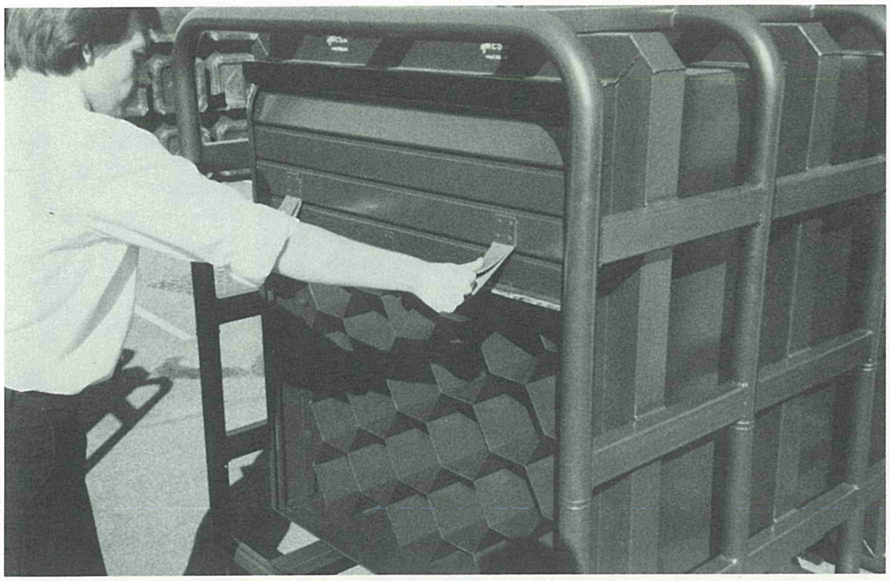
In the completed package, the product is completely surrounded by soft, custom-moulded, protective foam.



Stretch wrapping may be an attractive alternative to strapping.
A fully stretch wrapped unit load provides short term protection against rain, etc.



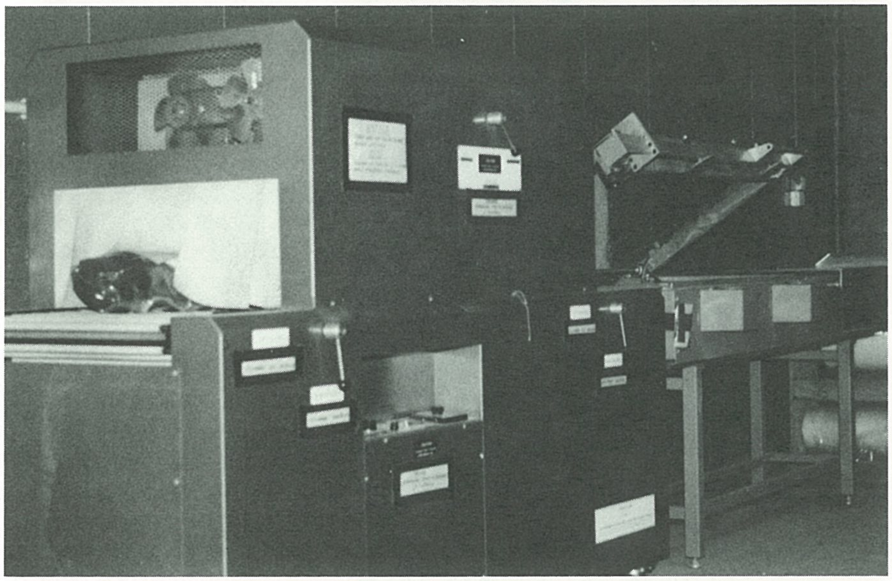
A CF warehouse where stretch wrapping is practiced.
Stretch wrapping, it has been found,
also reduces pilferage.



Furniture for 105 mm ammunition fit into each of the 33 cells of this unit load container.

however, a number of less specialized, less expensive, general purpose packaging techniques that are available to us. I wish to describe some of these already purchased by the CF for test and trial.

Foam-in-place packaging is a quick, efficient and economical way of providing a high degree of mechanical as well as environmental protection. The system produces custom cushioning, blocking and bracing similar to the foam cushioning used to ship delicate electronics equipment such as television sets or microwave ovens. A range of foams designed to protect everything from extremely delicate aircraft gyroscopes to heavy vehicle engine blocks are available. Liquid Polyurethane and a foaming catalyst are dispensed into the bottom of a carton (Fig. 1). A layer of poly is placed over the rising foam and the product is placed on the poly (Fig. 2). The foam requires 20 seconds to expand. More poly and foam is spread and dispensed over the product (Fig. 3). The carton is then sealed and ready for shipping. The product is now fully cushioned (Fig. 4). The system can, of course, be used with corrugated, wood or metal containers and is already available at most CF bases.



A heat sealer and shrink tunnel provides a secure and weather resistant overwrap.

Palletized unit loads of boxes or tires or sandbags or spent cartridge cases can be quickly, efficiently and economically stretch-wrapped, (Fig. 5) to provide security, mechanical and limited environmental protection. Fig. 6 shows a Canadian Forces warehouse with every unit load protectively stretch-wrapped.

Smaller items can be enclosed in plastic and shrink-wrapped (Fig. 7). This form of packaging is proving quite successful for clothing and textiles. Items are shrink-wrapped, put into boxes, which, when built up, are stretch-wrapped. The illustrated shrink tunnel was purchased for trial purposes. Most of us could not justify or afford such sophisticated packaging equipment. Most of us don't even need it; the same job can be done with an inexpensive impulse sealer and a hand-held forced-air paint remover available from hardware stores for less than $35.00.

Fig. 8 shows one of the ammunition containers acquired as a result of the previously mentioned UCR. They have a hermetic seal and yet offer almost instantaneous access to the rounds. We may even be able to afford this kind of luxury packaging, for it is less expensive than wooden boxes. The icing on the cake is the users who like the system. That experience could very well result in a number of improved large caliber ammunition delivery systems over the next few years.

These are but examples of some of the attempts to find improved packaging for the CF. As with development work in any discipline, some attempts to improve packaging have been more successful than others. There are, of course, the expected and usual constraints. However, each of these described systems was the direct result of a request by user groups for improved packaging. The attempts can be made and are successful more often than not.

TIRE MOUNTER/DEMOUNTER

by MWO (Bill) MacKenzie

This Directorate carried out a survey of tire mounters/ demounters in service and discovered that we are using multi types and models; some of which are no longer manufactured and others for which parts are no longer available. We intend to reduce the types of mounters/demounters to approximately three or four types of machines by introducing into the system a machine that will handle the complete range of tires currently used (except AVGP).

One model S34L mounter/ demounter was procured and trialed at Maintenance Section 22 Field Sqn, CFB Gagetown, during RV 81. The result of this trial carried out in static and field use proved it to be a very effective and satisfactory machine for the CF use. Therefore, DCGEM determined that introducing the S34L into the CF will eliminate many problems associated with mounter/ demounters.

Concurrently, LETE was trying to modify the AVGP mounter/ demounter so that it could be vehicle-mounted and air-portable. This modification was unsuccessful. It was determined that a requirement existed for a mounter/demounter capable of handling Hutchinson wheel assembly (AVGP) and the range of tires currently in use. It also must be capable of being vehicle-mounted for field use and air portable.

After several discussions with the users on CF requirements, the manufacturer stated that he could redesign/rework the model S34L to meet our requirements. A project was raised to have a prototype manufactured to satisfy the CF requirement. The prototype equipment was delivered to CFB Petawawa Sept 82 for evaluation. At that time a demonstration was conducted for interested personnel from the MLVW program and members of other Directorates of NDHQ. The concept of this prototype mounter/demounter proved to be what the CF required. After a trial period in a static location the equipment was vehicle-mounted and flown to Wainwright proving the concept of air portability. With some minor modifications, it was agreed that this machine would meet our requirements. Therefore, it was catalogued into the CFSS along with the regular machine, plus a kit for AVGP tires.

A modified model of this prototype was produced and an operational demonstration was held on March 2, 1984. The main purpose of the demonstration was the review and approval of the improvements to the machine that had been incorporated into the design. The major improvement to the machine was the addition of a mechanism which eliminates excessive physical handling of the Hutchinson insert during the installation phase of the tire assembly operation.

It was agreed by all personnel attending the demonstration that the performance of the modified tire changer was an improvement over the original prototype, also, that it must be vehicle-mounted for the MLVW program. After the suggested changes were made to the tire changer mounter/demounter c/w AVGP wheel service kit, it was approved for use by DND on the MLVW program.

As this vehicle-mounted mounter/ demounter was now approved for use, it was determined that a requirement existed to standardize the system with a floor-mounted machine of the same type for second line maintenance organizations, the only difference being the height, 61 inches versus 51 inches high required on the vehicle for air portability. The MLVW program will have the 51 inch high machine catalogued and procure quantity 15; 13 will be vehicle-mounted and the two remaining will be issued to the schools. We have catalogued the 61 inch high machine and the AVGP Kit. A contract has been awarded to manufacture 36 of the mounter/demounters and 30 of the AVGP Kit.

RETIREMENT OF 5120-00-222-1371 BLOWTORCH, G.

by Fred Scott, DCGEM 3-5

After approximately 75 years of faithful service in the Royal Canadian Navy, Canadian Army, Royal Canadian Air Force and the Canadian Forces, 5120-00-222-1371 Blowtorch G. (gasoline) has been retired from active service. While it is generally accepted that personnel are not indispensable when it comes to retirement from the Forces, it is sometimes difficult to convince users in the field that an item, as longstanding as the blowtorch, is to be retired with no replacement being 'posted' in. Some believe the torch is almost impossible to replace.

DCGEM 3-5, who has the responsibility of being lead LCMM for over 350,000 line items of common user classification, is frequently faced with identifying replacements or 'in lieu' items for materiel which has become obsolete or is removed from CFP 137 simply because the item is no longer produced or manufactured. Our old friend G. Blowtorch has fallen into the 'no longer manufactured' category and we have been advised that a suitable replacement is to be found and introduced into the Canadian Forces Supply System to satisfy the requirements of the following scales and check lists in which the torch was listed. So begins one more sub-project to identify an acceptable replacement of an obsolete item.

5120-00-222-1371 Blowtorch, gasoline, lqt cap. Scaled in BSF4000 – Pt A Scale

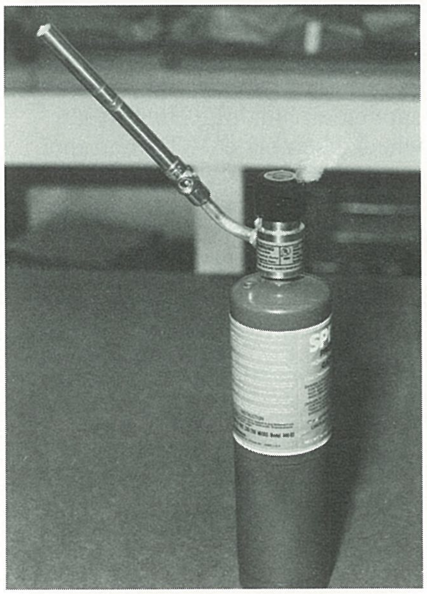
760-8 Cbt Gp Units Europe
760-8A Cbt Gp Units Canada
760-8B Misc. and Training Units
490-28 Engineering Units Canada
490-30 Engineering Units Canada
490-40 Mech Svc Bn Europe
490-41 SBG Svc Bns Canada

Equipment Check Lists

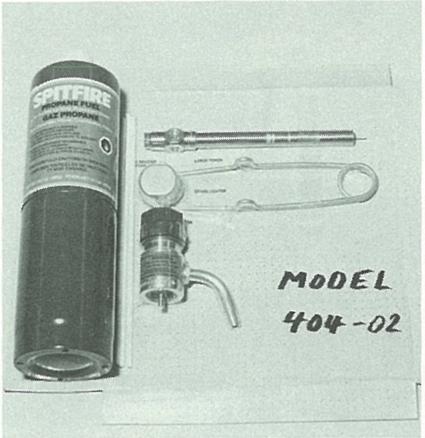
L30-345-000/LC-002 (S23-099)	Truck Cargo 2½ W/Autom Mach Shop Equipment Load C
L30-342-000/LC-007	Truck Cargo 2½ W/Sheet Metal Shop
L30-346-000/LC-007	Truck Van 2½ W/Autom Electrical Repair Equip, W/E
L30-342-000/LC-006	Truck Cargo 2½ Ton W/Contact Maint Equip, RCE
L30-346-000/LC-009	Truck Van, 2½ Ton W/Autom Machine Shop Equip, RCASC
L30-346-000/LC-015	Truck Van 2½ Ton W/Radar Maint Shop Equip
L30-202-000/LC-016	Truck Van 1¼ Ton Auto and IC Engine Repair
L32-547-000/LC-000	Semitrailer, Van, Auto Militia Servicing, W/E
L30-841-000/LC-005	Trailer Cargo 1½ Ton W/Welding Shop Equip ARC/MIG
L49-071-560/LC-006	Tool Kit Machinist (AMMO Depots) Civ
L49-070-550/LC-001	Tool Kit, Crash
L49-070-446/LC-001	Tool Kit, Signals, Basic

Communication with the last known manufacturer of blowtorches resulted in a negative response when they were requested to produce the quantities required by the CF. They explained that since the relatively inexpensive LPG devices were introduced, the market demands for the traditional torch has dropped by approximately 95% and they could no longer afford to remain in production. The fate of G. Blowtorch had been finally sealed. Retirement from the CF was imminent and irreversible.

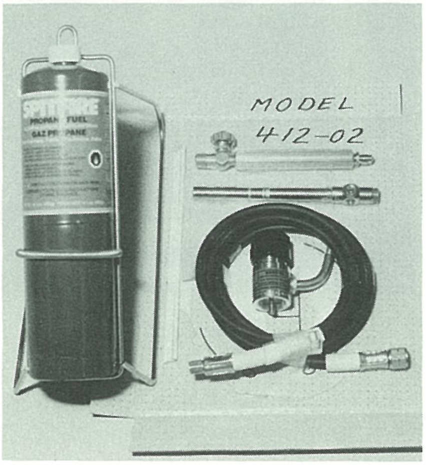
The research for a replacement pursued a course to determine if any enterprising company, national or foreign, had tried to modify the old torch to perhaps take advantage of the convenience of LP gases. The search revealed that the only heating devices which could possibly replace the functions of the blowtorch were a limited variety of LPG torches. While initially the catalogued standard propane torch 4940-21-639-3693 was considered as a replacement item it was found that two new manufacturers had recently introduced their versions of LPG torches to the consumer and industrial markets and that there were additional features on these torches which warranted investigation by DCGEM 3-5.



Model 404 assembled



After studying technical documents on the two torches being considered, practical demonstrations of the capabilities of the units were arranged with the manufacturers and 'hands on' testing was also conducted. The demonstrations provided, and the testing of each torch under somewhat limited conditions indicated that there was a good possibility that either torch could be the new recruit to fill the position of G. Blowtorch (Rtd). It was decided that several models of LPG torches from two independent manufacturers would be more critically examined. DCGEM will be conducting engineering trials under field conditions on the selected models and their variations. Brief descriptions of the units are outlined in the following paragraphs.

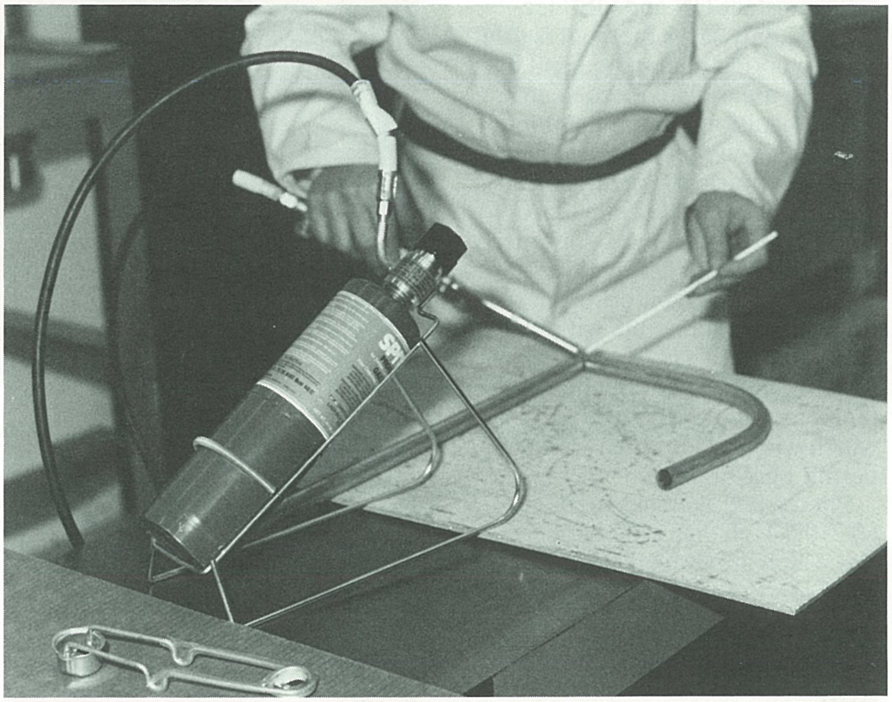


SPITFIRE 404

One of the models to be trialed early in 1985 is the Spitfire Model 404 shown in photos marked 404. The torch has been carefully engineered to develop maximum heat on the target. This torch will heat faster and hotter than the model catalogued in CFP 137 because the amount of gas flowing into the torch is metered by the precisely controlled drilled orifice. The jet pump venturi sucks in the correct amount of air for ideal combustion. A helical flame holder in the flame tube starts the gas/air mixture to spin and it is this swirl combustion that develops an ideal flame for transferring heat to the target. This simple design change in propane torch construction has been revolutionary in that the effectiveness of gas/air torches has improved by close to 100%. The swirl combustion is characterized by its high velocity and stable flame which is extremely effective in heating the work. This torch is the first hand propane unit ever presented to the public which will generate sufficient heat on the target to enable a person to braze metals. Use of the torch permits a person to effect repairs on many materials that heretofore were not possible with the standard propane torch.

SPITFIRE 412

The Spitfire 412 is basically the same torch as the 404 but is fitted with an automatic regulator which ensures a constant flow of gas through the torch and eliminates the need to regulate the flame for ideal combustion. The 412 must be operated with the gas valve in the fully open position at all times. Other accessories which set the 412 apart from the 404 are shown in the photos marked 412. These accessories would be available by part number to upgrade the 404 as required. Both Spitfire models must be ignited with a flint striker as no means of automatic ignition has been incorporated into the design.



Model 412 assembled

INSTATORCH 60-2102

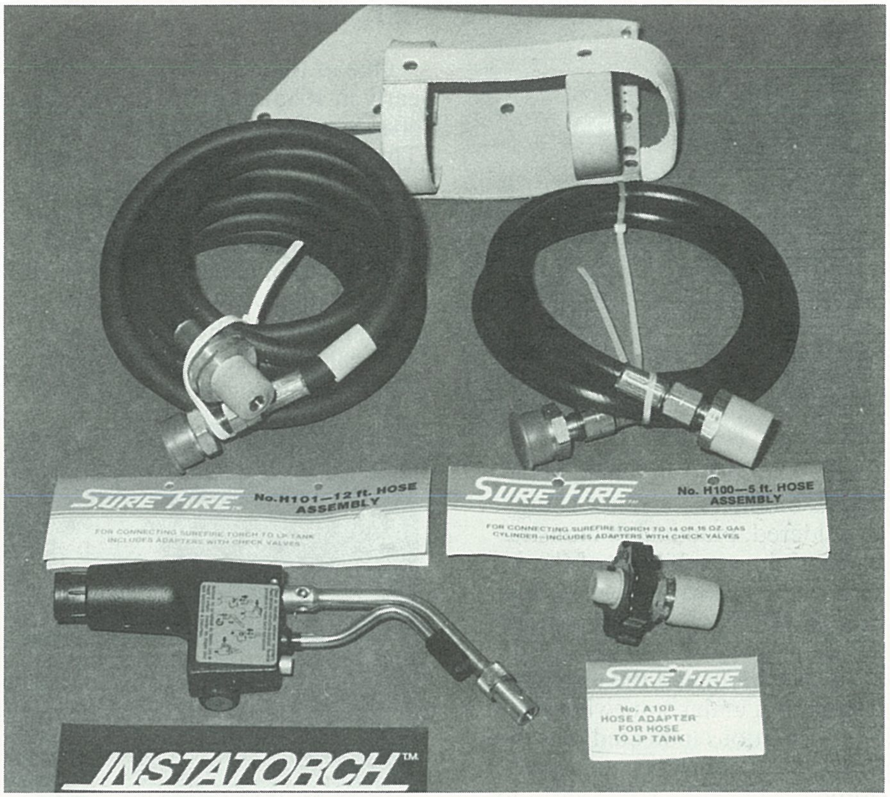
Instatorch is an instant lighting torch that will eliminate the use of matches, scratch flint strikers or batteries for ignition. The torch is constructed of tough, long lasting cast aluminum, stainless steel and brass making it ideal for professional use under rugged working conditions, encountered in most military environments. The torch functions perfectly on its side, upside down and in winds up to 96 Kmh.

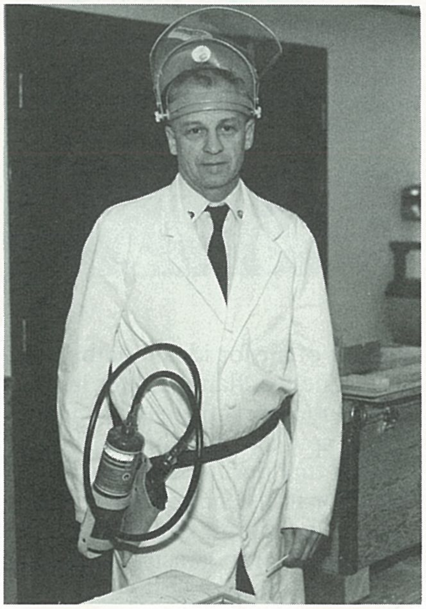
The instant ON and OFF feature not only saves fuel, but is safe when working in cramped and hard to reach areas. The Piezoelectric Crystal ignition system, combined with a built-in fuel regulator and unique venturi air system, consistently produces a 1927°C (3500°F) flame at 97% efficiency. A properly maintained torch will provide upwards of 40,000 ignitions from the crystal and will operate with propane or MAPP gas. The use of MAPP gas will increase the flame temperature to 2037°C (3700°F) which will provide a heat range to permit light brazing.

Photos and sketches marked 60-2102 show the range of accessories which are available for the basic torch. It is considered that combinations of these accessories with the basic torch will meet the requirements of most users in DND.

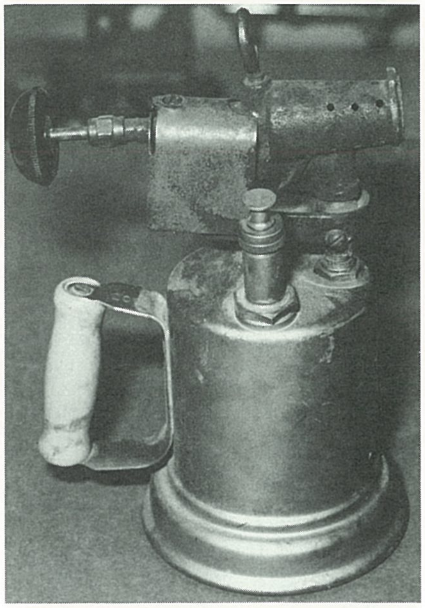
Engineering evaluation trials will be undertaken by DCGEM during summer 85 which will permit inputs from the field. The information from such users will receive primary consideration prior to NDHQ determining the recruit most suitable to follow in the footsteps of our long serving Blowtorch G. (Retired).

BRAVO ZULU


SURE FIRE
No. H101—12 ft. HOSE ASSEMBLY
FOR CONNECTING SUREFIRE TORCH TO LP TANK INCLUDES ADAPTERS WITH CHECK VALVES
SURE FIRE
No. H100—5 ft. HOSE ASSEMBLY
FOR CONNECTING SUREFIRE TORCH TO 14 OR 16 OZ. GAS CYLINDER—INCLUDES ADAPTERS WITH CHECK VALVES
SURE FIRE
No. A108 HOSE ADAPTER FOR HOSE TO LP TANK
INSTATORCH™



Instatorch 60-2102 assembled



Blowtorch

CHALLENGES AND CONSTRAINTS IN DESIGNING MILITARY UNIFORMS

by Keith Charles

Mr. Scavo is seen here tracing collar pattern of the new men's workdress jacket.

When I began my career as a designer of military uniforms 15 years ago, I was determined to introduce a breath of fashion into military clothing. After all, I was coming from the commercial clothing world where 'fashion' changed each Fall. No more of these baggy trousers, I thought.

A wise Director, Mr. Gerry Holmes, intervened however and saved the day. Before I could lift a drawing pencil or a pair of scissors, I had to go out in the field to wear the garments under operational conditions.

The result? Would you believe I thought the uniform could do with more room?

That was my first lesson in the constraints of designing military uniforms.

In designing military uniforms, there are three main factors to be considered — cost, function and aesthetic.

In military uniforms every dart, every zipper and every seam must have a purpose and must be in the right place. Fire-retardant materials, extremely expensive, must be used economically and, therefore, paper patterns must be designed accordingly.

Rainwear and chemical warfare garments are also given a great deal of consideration from a point of fabric utilization and the function for which the garment is being designed.

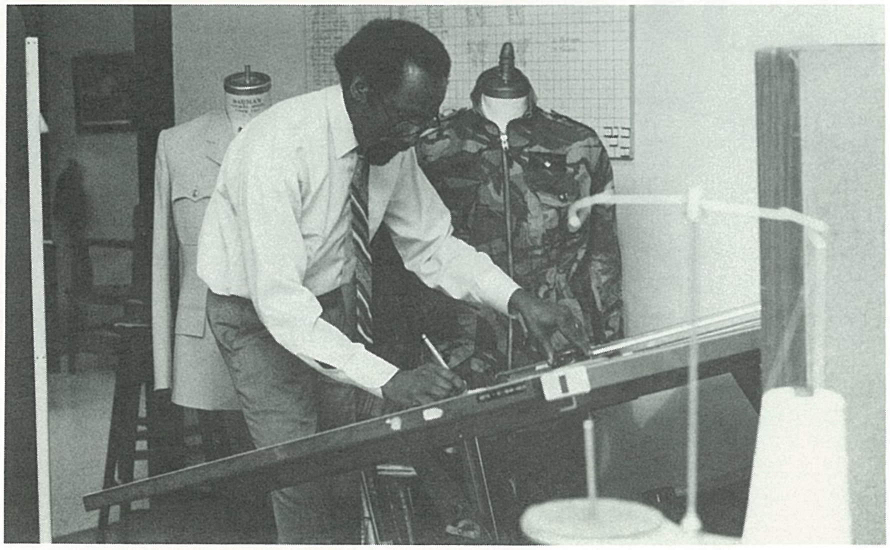
In the case of dress uniforms, the challenges are somewhat different. Aesthetic and fit of the uniform come into play. I am very often asked, 'how come my uniform jacket does not fit as well as my civilian one'? The answer is a simple one but, usually, I have difficulty explaining if I happen to be talking to a portly shaped gentleman or a lady with a 44 inch bust.

Since all master/original patterns are based on a set of measurements that are generally referred to as 'regular' measurements (5′8″ height, 40 chest, 34 waist, 42 seat) a man whose stature is corpulent or stout will require a different master pattern in order to be provided with a good fit. Similarly, a woman who measures 44 bust, 30 waist and 48 hip requires a pattern that incorporates the abnormal proportions.

Recognizing the problem, about 5 years ago we increased the number of sizes of the Coat, Mans, to 44 from the original 23 size range. This necessitated constructing a different master pattern in order to fit semi-stout statured men.

Although this is common practice in industry, the Canadian Forces just cannot afford such luxury, taking into account the 150 plus uniforms currently in the system.

In conclusion, let me say that designing military uniforms is a real challenge which I have enjoyed in spite of the constraints mentioned above.



Mr. Charles at drawing board designing shirt pattern.

THE COMPUTER AND THE PATTERN: A SUCCESSFUL ALLIANCE

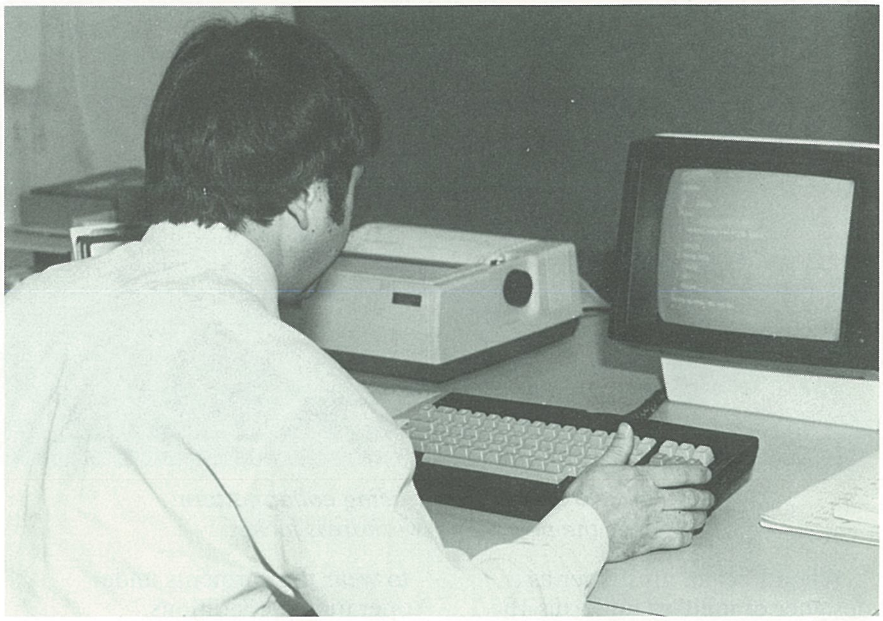
by Mr. L. Rea

One of the recent innovations in DCGEM has been the introduction of the computer into the Directorate for the grading of patterns. 'Grading' is the art of increasing or decreasing a sample size pattern proportionately, according to the standard body measurements. It is a meticulous, repetitious and time-consuming operation. It involves shifting each pattern piece from point to point, carefully tracing each step.

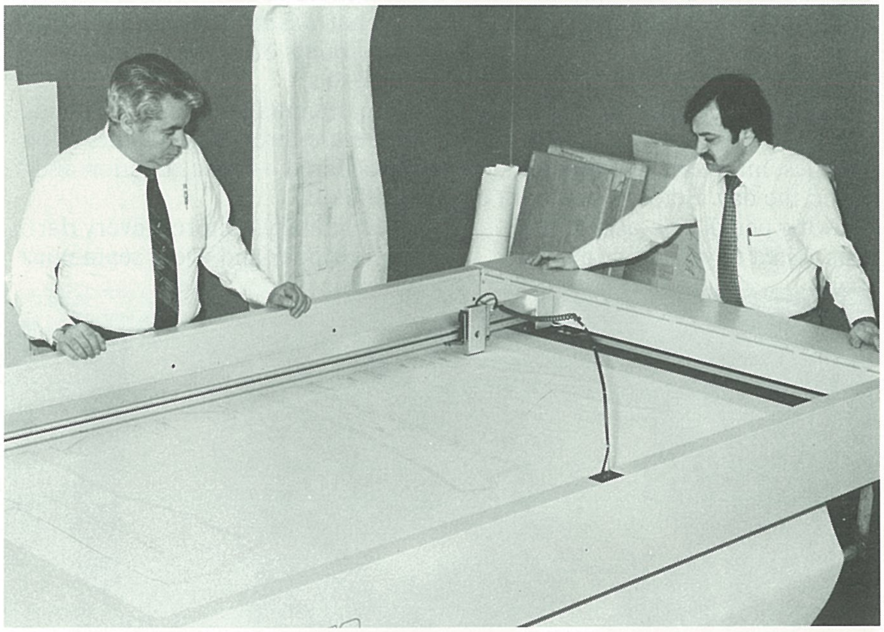
The master pattern for each garment must be graded to produce patterns for all sizes in which the garment is to be manufactured — an incredibly laborious process when done manually. In addition, any alteration in design requires the same precision, requiring more hours at the drawing board. In any modification to a basic design, each pattern must be adjusted, not only at the key alteration point, but in other areas of the pattern affected by the basic alteration. These 'spin off' adjustments often require intricate calculations to reposition buttonholes, buttons and pockets, add or take away fullness, add or delete space between the front closure and a pocket, et cetera.

Canadian Forces patterns accommodate six height groups, normally consisting of 44 sizes for men and 24 sizes for women. The large number of variables required to define the scale of measurements adds to the complexity of the problem. The many processes involved in producing patterns made pattern grading a likely prospect for some mechanized assistance.

In addition, there is an on-going requirement to prepare markers



Mr. R. Marinelli, at Control Unit Terminal, enters rule table data.



Mr. L. Rea & Mr. R. Marinelli examine a nest grade of coat, men's CF while the plotter is plotting.

and paper patterns in response to tendering of contracts. A 'marker' is the positioning of pattern pieces on the fabric to be cut to determine its most economical use. Once a marker is prepared (and each marker must be tailored to the facilities of a given manufacturer) the pattern pieces must be traced and reproduced to accompany the contract. A study determined that these tasks could be accomplished with more precision and greater speed by a computer.

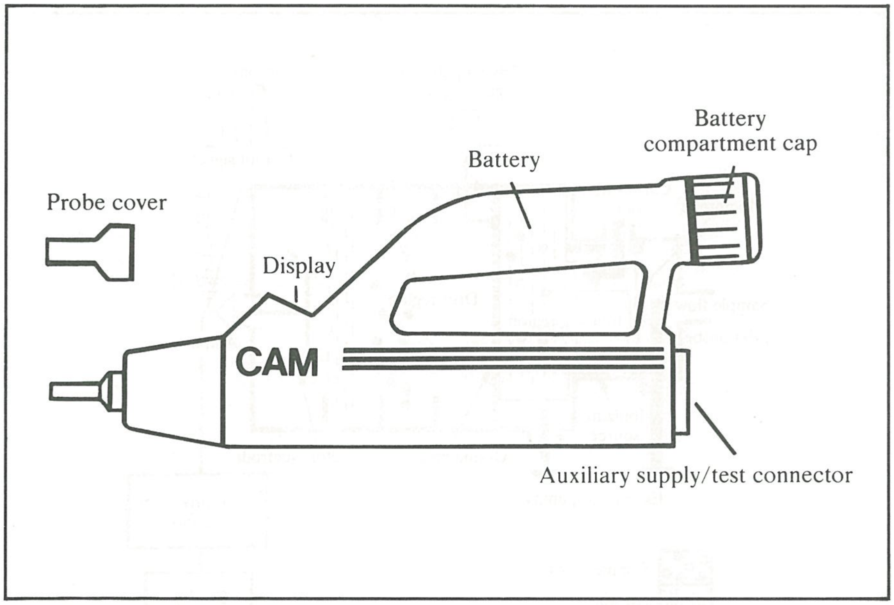
Finally, master patterns are prepared on cardboard and require a considerable amount of space for physical storage. With the computer, the master pattern can be stored on a floppy disk.

Enter the computer, and the prototyping shop moves away from its nineteenth century image! The computer can take over the labor-intensive processes of grading patterns and preparing markers. It can produce markers and soft patterns automatically. It can assume the storage and cataloguing requirements of the more than 165 dress and operational patterns, the 70 existing patterns for personal and field equipment and the additional 60 - 80 patterns retained for historical and reference purposes. These statistics do not include the new uniform! Add 60 or more dress and operational designs.

Introduction of the computer has resulted in a considerable decrease in the time required to create new sizes; many tedious and repetitive tasks have been eliminated; and the space requirement for storage of paper patterns is reduced dramatically. It is estimated that introduction of the computer into the pattern development and production process has already resulted in considerable savings in man-hours by speeding up the processes, is effecting a substantial saving in dollars in duplicating costs, and has reduced storage space requirements by seventy-five percent.

CHEMICAL AGENT MONITOR (CAM)

by Maj P.G. Pothier



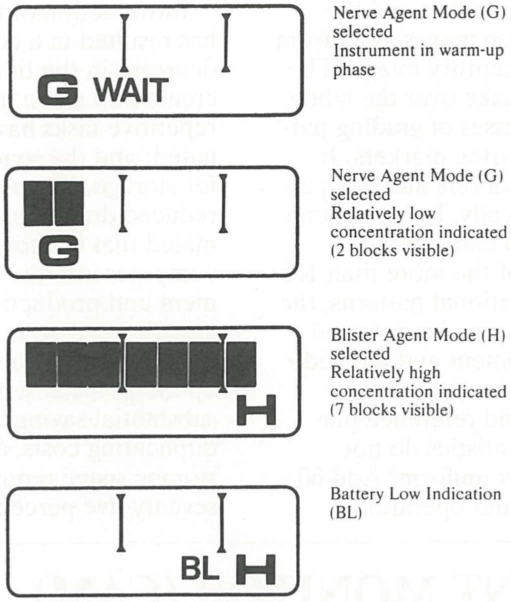
One of the most exciting pieces of equipment soon to be acquired by the Canadian Forces is the Chemical Agent Monitor, or CAM for short. What is CAM and what does it do? Why is it exciting? How does it work? What's in it for me/us?

WHAT IS CAM AND WHAT DOES IT DO?

CAM is a portable hand-held instrument for use by CF personnel for monitoring all types of surfaces for the presence of nerve or mustard agent vapours. The instrument's response is very specific to these agents and will be used to indicate the presence of agent following attack, agent residues following decontamination and, by monitoring the ambient air, it will determine if it is safe for personnel to relax full NBC protection.

CAM was developed in the UK by Graseby Dynamics Ltd under contract to the UK MOD. British Forces are now acquiring CAM and the US is close to signing a contract. Canada is currently staffing a proposal through the normal chain to obtain approval to buy.

The equipment is 38 cm long and weighs 1.5 kg. It is powered by a 6V lithium battery which will permit some 10 hours of operation. Provision is made for external power, remote indication of response and diagnostic output. The only operator controls are an ON/OFF push button and a MODE CHANGE button (nerve or mustard). The CAM is usable by personnel in full NBC protection. The display is liquid crystal with tritium backlighting and is semi-quantitative.


G WAIT
Nerve Agent Mode (G) selected
Instrument in warm-up phase
G
Nerve Agent Mode (G) selected
Relatively low concentration indicated (2 blocks visible)
H
Blister Agent Mode (H) selected
Relatively high concentration indicated (7 blocks visible)
BL H
Battery Low Indication (BL)

Examples of CAM display

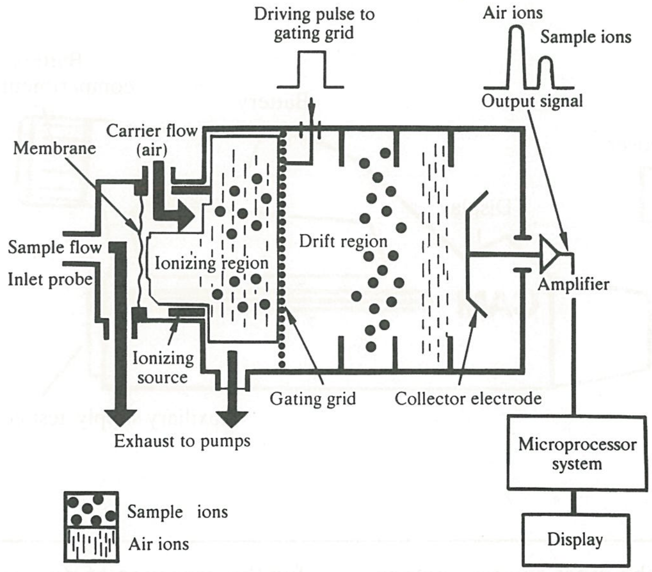
WHY IS IT EXCITING?

CAM is the first equipment of its type to enter service in the west. It is a first generation instrument and represents a quantum jump for chemical agent detection/monitoring in the field. The principles of operation and design features makes CAM a clear leader amongst the competition. For operations in a chemical environment, CAM will enable troops/units to operate at a much higher combat efficiency by minimizing the amount of time spent in full NBC protection. It will determine whether personnel, equipment, supplies and even ground has been contaminated or is clean. It will confirm whether or not decontamination procedures have been properly carried out. For maintenance personnel it will determine if equipment undergoing repairs has any residual contamination and this can be continuously checked while the equipment or component is being stripped; something which was not possible a few years ago. In operational jargon CAM can be considered a "combat multiplier".

HOW DOES IT WORK?

CAM makes use of ion mobility principles to respond selectively to agent vapours of interest.

Air, which is drawn into the unit by a pump, is ionized by a weak radioactive source. As a result of complex interchange reactions which then take place the molecules of certain species of trace vapours form ionic clusters of low mobility while others do not. The ions of these species are then further classified according to their relative mobilities. Existence of a given level of toxic hazard is calculated by an on-board microcomputer and shows on an LCD display.



CAM Principles of Operation

The techniques employed enable specific nerve or mustard agents to be monitored at very low level — whether found at isolated spots or present in the general atmosphere. Good discrimination is also obtained against interfering vapours likely to be found in battlefield situations. The instrument operates in real time and will recover quickly after exposure to strong concentrations of vapour but, because of the sensitivity, care has to be taken not to pick up and retain agent material on the inlet probe. To prevent this happening a low cost disposable 'stand-off' collar is provided.

Warm up time (at an ambient of 20°C) is about one minute an a built-in test programme is used to show the user that the equipment is functional and ready for use.

WHAT'S IN IT FOR ME/US?

CAM will be the first automatic and continuous monitoring instrument soon to be in the hands of maintainers. As previously outlined it will firstly make life easier and more tolerable should we ever be faced with having to conduct operations in a chemical environment, and secondly (and perhaps of greater importance) it will enable us to fulfill our mission. It might even open our collective eyes a bit wider and make us appreciate more fully the ever increasing problem of not only surviving, but maintaining operations (and operating a maintenance system) in a toxic environment. There are untold problems that have just begun to surface for maintainers. These problems include such things as specialized equipment decontamination, specialist clothing, clean air benches that provide not only particulate-clean air but **chemically**-clean air, over-pressure collective protection for SEVs, and chemically resistant maintenance shelters of all types. Superimposed on all of the above is the need to train and practice maintenance skills wearing the gas mask, CW suit, boots and gloves, plus any additional environmental clothing required. Heat degradation, reduction of vision and hearing, loss of dexterity, lack of communication, and disorientation are all factors that will seriously impact on a tradesman's ability to accomplish his task. CAM is part of the answer but the rest is up to us!

SLOWPOKE-2 NUCLEAR REACTOR FOR RMC

by Capt C.J. Thorp, DCGEM 5-4

In January, 1984, the Royal Military College of Canada received NDHQ approval for the acquisition of a SLOWPOKE-2 Nuclear Reactor from Atomic Energy of Canada Limited for teaching and research purposes. At this time DCGEM 5-4 was assigned as the Project Manager for the equipment while RMC accepted the responsibility as Scientific Authority.

A slow what?

SLOWPOKE stands for Safe LOW Power Critical Experiment. The Letter K is used in place of C because K, in nuclear engineer terminology, implies a physical parameter which helps in mathematically describing neutron behaviour in the reactor.

The reactor package basically consists of five separate parts. Firstly, the reactor core with beryllium reflector lying near the bottom of the reactor container is of primary importance since it is the source of neutrons to be utilized. Secondly, the reactor coolant/neutron moderator consists of two physically separate water systems which double as a safety shield to prevent the escape of unsafe levels of radiation. The reactor container is designed to be watertight in order to separate the coolant/moderator water from the pool water. The reactor core is cooled by natural convection and heat from the coolant passes through the wall of the container to the reactor pool water which is held in a stainless steel lined concrete tank 2.46 metres (8.97 feet) in diameter and 5.87 metres (19.26 feet) deep. Heat is then removed from the pool water by means of a cooling coil connected to a supply of water. Thirdly, the deioning system consists of two banks of ion exchange resins required to purify and separate radioactive contents of the reactor container coolant/moderator and the reactor pool water. Fourthly, the irradiation system allows introduction of small capsules containing samples to be introduced into the reactor core area using a pneumatic tube arrangement. Lastly, the desk top size control system monitors basic data such as pool water temperature and neutron flux level while providing for neutron flux level adjustment and reactor start-up/shut-down.

SLOWPOKE is basically a small, safe research reactor which is specifically designed for self regulation. Essentially, the water in the reactor must always remain within a narrow range of temperature for a given core neutron output level. At warmer temperatures the water is less dense and hence fewer neutrons are slowed and less heat is generated. As a result, water temperature will decrease and neutron output will adjust to the proper safe level of performance. For example, SLOWPOKE cannot operate at the maximum neutron output level for a prolonged period of time without the reactor essentially shutting itself down as described.

As a result, SLOWPOKE is the only reactor type in Canada licenced for unattended operation. Unlike most nuclear reactors, SLOWPOKE is not designed for production of electrical power. In fact, the reactor fuel, which sits 4.42 metres (14.5 feet) below the surface of the water-filled pool, consists of only approximately 200 pencil-like rods of uranium fuel arranged in a cage-like assembly 22 cm (8.66 inches) in diameter and only 22.63 cm (8.91 inches) tall. As well, this small amount of nuclear fuel only warms the pool water to about two degrees centigrade hotter than room temperature.

Generally, SLOWPOKE has been used by universities and research institutions, such as the University of Toronto, since the late sixties for chemical analysis of samples. This requirement can vary from oil analysis to archaeological assessments. For example, SLOWPOKE can be used to chemically distinguish between two visually identical hair samples. SLOWPOKE can also be used to create radioactive compounds for medical use or industrial tracing applications.

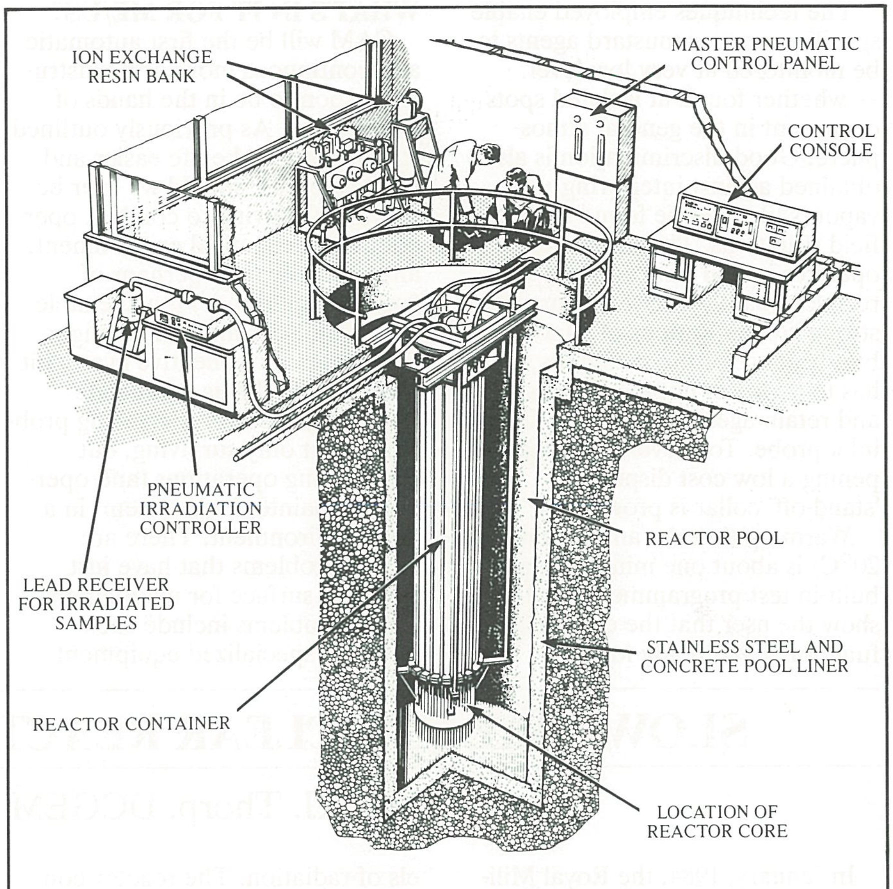
So why does RMC need a SLOWPOKE?

The primary use for the nuclear reactor at RMC will be teaching. The curriculum of various faculties; including science, physics, and engineering, will be greatly enhanced. As well, post-graduate training, particularly in nuclear engineering, will utilize the new equipment.

SLOWPOKE will also be a useful tool supporting research at RMC and throughout DND. Additional justification for the reactor is also found in radiation safety training, nuclear accident support team training and non-destructive testing in the form of neutron radiography. The general use of the SLOWPOKE reactor, however, is not limited to these areas. The SLOWPOKE can also be used to investigate a variety of other areas such as the effect of neutron radiation on the performance of electronic components or any other interesting or diverse applications.

Will the RMC SLOWPOKE be unique?

The RMC SLOWPOKE will be the only research reactor of the nine to date equipped for the conduct of neutron radiography. This capability will not be available from initial installation but will be developed and installed within two to four years of initial operation. Secondly, the fuel life is estimated to be 25-30 years by use of a new initial start-up procedure and selection of a new, improved fuel type. Finally the RMC site for SLOWPOKE provides the additional feature that the local water table (in close proximity to Lake Ontario) is so close to ground level that the pool water cannot unintentionally drain out.


ION EXCHANGE RESIN BANK
MASTER PNEUMATIC CONTROL PANEL
CONTROL CONSOLE
PNEUMATIC IRRADIATION CONTROLLER
REACTOR POOL
LEAD RECEIVER FOR IRRADIATED SAMPLES
STAINLESS STEEL AND CONCRETE POOL LINER
REACTOR CONTAINER
LOCATION OF REACTOR CORE

SCHEMATIC OF A TYPICAL SLOWPOKE-2 REACTOR INSTALLATION

What is the status?

The local Kingston community and civic officials have been kept aware of the installation of a SLOWPOKE reactor in the Kingston area. Public reaction has been generally positive with only limited expressions of public concern.

RMC is scheduled for SLOWPOKE installation and commissioning by mid-summer 85. The original target date was February 86, however, early reactor acceptance will guarantee the speedy availability of this versatile equipment for introduction into RMC courses and general use by other DND establishments.

TRIALS AND TRIBULATIONS

by Capt S.D. Morden

When the Director and I were reviewing the topics for inclusion in this issue of this most esteemed journal, we discovered for equality, that we were one article short. My boss, Mr. Bill Victor, had submitted five topics of which two had been selected. Bill had submitted a topic titled 'Trials, A Factor During Development'. So, being DCGEMs Trials Officer, I got hooked to write the last article.

Trials — A Factor During Development! I think it is the most important factor. How many times have you heard in the field 'I wish the S.O.B. who developed/introduced this piece of junk into service was here to use it'? An often heard phrase. Why does this situation develop? After spending nearly 35 years in the Canadian Forces, my conclusions are: No pre-issue trials and tests, bad testing procedures or politically imposed decisions. Imposed decisions we can do nothing about, but the others we can.

DCGEM is unique in that there is a position on the establishment annotated 'Trials Officer'. This officer is responsible for conducting or coordinating all trials within DCGEM. The philosophy within DCGEM is that the Project Officer who develops an item should not be the one to trial it.

Trials and tests are defined as follows within DCGEM:

a. **Engineering Tests** — the use of specialized techniques and/or equipments applied in accordance with some agreed military or civilian test procedure, which produce data indicating whether or not the materiel under test meets some agreed military or civilian standard.

b. **Engineering Trials** — trials during which the design authority establishes whether or not materiel is technically acceptable under conditions which give a reasonable indication of how the materiel will perform in its intended use.

c. **User Trials** — trials during which the user establishes whether or not the materiel is acceptable under conditions as closely as possible duplicating those under which the materiel will be used in its intended role.

Project Officers are responsible for the conduct of engineering tests necessary during the design and development of equipment to the stage at which it is ready for engineering trials. The Trials Officer is responsible, on behalf of the Project Officer, for the conduct of engineering trials including coordination, administration and technical support. During user trials, for which the user directorates i.e., Directorate Land Requirements, Directorate Aerospace Requirements, etc., are responsible, the Trials Officer coordinates the DCGEM participation. Engineering and user trials may be combined to form one trial.

If the above phases are followed the field should be provided with a usable piece of kit. We cannot hope to satisfy 100% of the user requirements, but using this system we hope to satisfy at least the majority.

As I will be retiring in the near future, a position will become available within DCGEM for an energetic young Capt/LEME. He must be willing to trial such things as maternity uniforms, slush boots, MP hat bands, helmets, smoke machines, etc. If you have the qualifications, let your career manager know.

FLAME RETARDANT (FR) MATERIALS FOR OPERATIONAL MILITARY CLOTHING

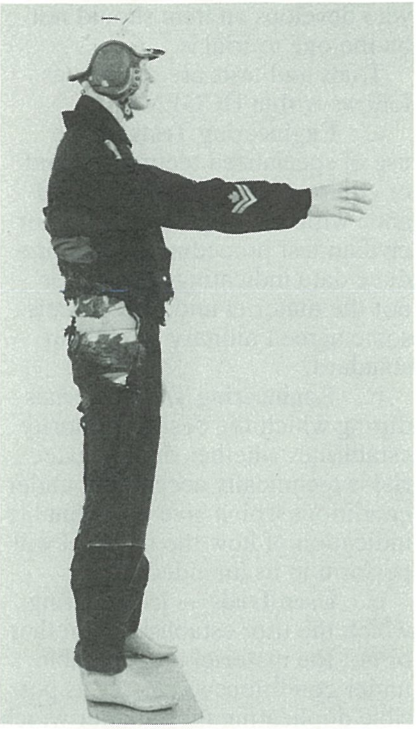
by Mary McLaren

INTRODUCTION

When faced with the task of providing flame retardant clothing for operational military personnel, it is relatively easy to identify several materials that are readily available and described as being flame retardant. While FR materials may enhance the protective properties of clothing, we must recognize the fact that there is still a lot that is not known about how to protect the human body from burn injury. There has been a tremendous amount of work done on the subject of textile flammability and protection from burn injury by research organizations world-wide, but there is still controversy and no international agreement on how to assess the threat or how to evaluate the capability of clothing to protect the wearer.

While it is impossible in this paper to address all of the variables that contribute to this complex issue, it is useful to review some observations that were made following an accident involving a CH 147 helicopter at Rankin Inlet in August, 1982.

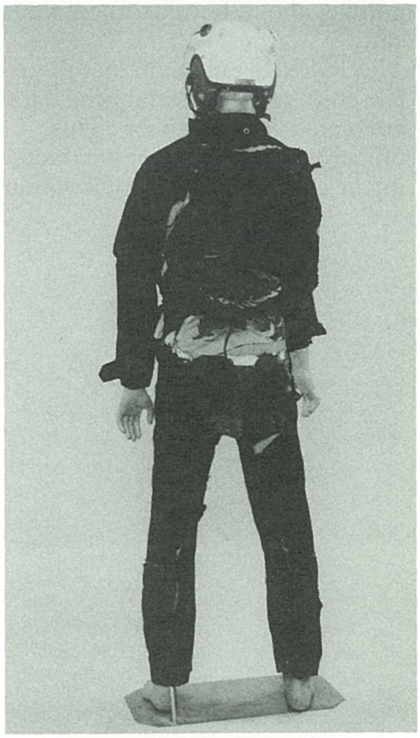
There were three survivors of the CH 147 accident, all of whom suffered varying degrees of burn injury. One man received fairly severe burns to his face and hands. He was not wearing any headwear or handwear at the time of the accident which simply points to the fact that all areas of the body should be covered as completely as possible to protect from burn injury. Another man was burned quite badly on his back and upper legs. It appears that the bottom edge of the back of his jacket caught fire, causing the coverall to burn as well, with the resulting heat causing burns to the back area. It should be noted that the edge of any piece of clothing, hems of jackets, sleeve and trouser cuffs, will catch fire much more readily than a flat surface, and if the flame has a chance to propagate in a vertical direction, the material will burn much more quickly than in a horizontal direction. Protection from burn injury can therefore be increased by ensuring that sleeve and trouser edges fit snugly around the body and that over-clothing such as jackets are fastened, particularly at the bottom edge, to avoid presenting a free edge to an open flame.



Sideview of uniform ensemble showing burn damage to back of jacket and coverall.

The most interesting observation from this accident is the fact that all three survivors had varying degrees of burns under layers of clothing that remained intact after exposure to flame. The area of the jacket or coverall corresponding to the area where burn injury was sustained, was burned, or had melted and adhered to the underwear, however, the underwear itself had not burned. In fact, close examination of the three sets of underwear worn by the survivors revealed there was no damage to this layer of the clothing at all, even though all three men suffered burn injuries on areas covered by the underwear.

The underwear worn by the survivors was 100% cotton lightweight and heavyweight longjohns and polyester/cotton T-shirts in squadron colours. It is difficult to determine from this accident what effect the differences in fabric weight and fibre content of the underwear had on protection from burn injury. However, there is no evidence to suggest that 100% cotton provided greater protection to the skin than blends of polyester and cotton. It is clear that the underwear provided a protective layer from open flames and that if the underwear layer had not been there, the burn injuries would have been much worse.

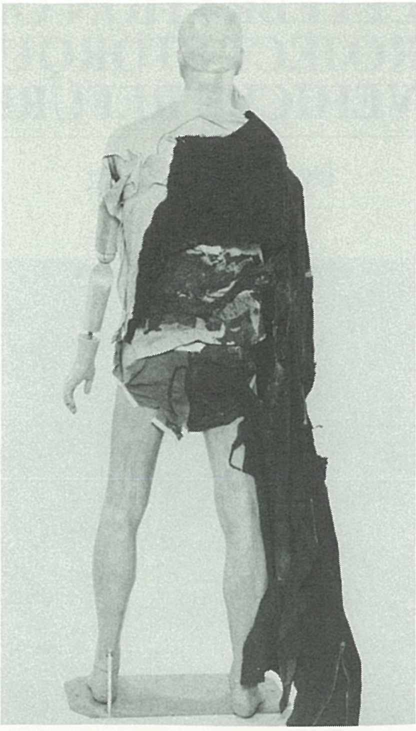


Backview of coverall showing burn damage to coverall and areas where coverall had melted and adhered to underwear.

Also, even though the underwear itself did not burn, there was sufficient heat transferred through the underwear to burn the skin underneath. Again, if the underwear layer had not been there to provide some insulation against the heat of the fire, the burn injuries for all three of the survivors would have been much more severe.

This observation draws attention to a very critical aspect of protection from burn injury, the necessity to insulate the body from radiant heat. It is only recently that a standardized test has been available to assess a material's insulating capability against radiant heat. It should be noted that heat can be transmitted through a material regardless of whether or not a material is flame retardant. In other words, even if a garment were made from a material that did not burn, it would still be necessary to wear underwear to provide insulation from the heat of a fire. It has not been clearly established that underwear should be flame retardant. In fact current trends in protective clothing favour an outer shell, which does not burn and retains its shape when exposed to heat, with an underwear layer which does not have to be flame retardant but provides the best insulation possible.

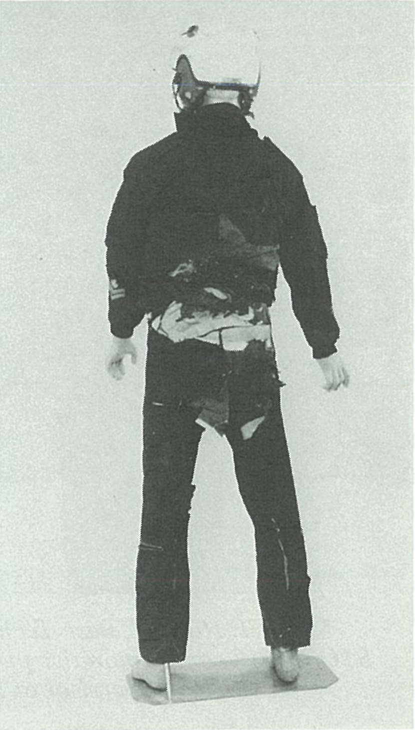
It is understood that there is some reluctance on the part of operational personnel to wear layers of underwear, particularly in hot weather. While this point is understood, the fact is, that without the insulation of the underwear, protection from burn injury will be greatly reduced.



Backview of coverall over underwear showing areas where coverall had melted and adhered to underwear.

In selecting or developing materials that will meet the requirements of operational military personnel, there are many other aspects related to burn protection other than those described above that must be considered. These include rate and amount of heat release, smoke evolution, toxicity of combustion by products, ease of flame extinction, and limited oxygen index. In addition, factors such as durability, comfort and toxicity of certain FR finishes have to be taken into account.

Finally, flame retardant materials that meet the needs of the user can be provided only after the threat has been defined and the tests that will adequately predict protection from burn injury have been identified.



Backview of uniform ensemble, showing burn damage to jacket and coverall.

CELEBRATION OF PROJECT STORQUIP 500TH VEHICLE REFURBISHED

by Lt R.P. Lyng

Maj H.T. Higuchi, Base Technical Services Officer presenting a STORQUIP commemorative plaque to Mr. B.D. Rodgers, the civilian supervisor of Project STORQUIP.

I must commend the LEME Branch. During 1984, its birth year, it has focussed a great deal of attention on the 40th anniversary of its parent, the RCEME Corps. Reflections on the past are both admirable and practical: they serve as an excellent means of establishing 'esprit de corps' and a strong sense of identity.

The risk exists, however, that the branch will fix its gaze on the past, and in doing so, fail to recognize the achievements of the present. The Branch may stumble backward into the future. A brief diversion of the Branch's attention from the events of the past to the milestones of the present will certainly diminish any such risk.

Base Maintenance, CFB London has done its part. On 11 Oct 84, the Base Workshop commemorated a milestone reached by today's tradesmen: the completion of CFB London's 500th refurbished vehicle under the NDHQ/DSVEM directed refurb programs.

In June 1976, after successfully conditioning 191 trailers, Base Maintenance, CFB London received a lot of 65½ Ton SMP trucks for refurbishment. DSVEM, satisfied with both the prompt completion and quality of vehicles produced, added additional lots to the program. When the 2½ Ton project was phased out in 1981, DSVEM introduced project STORQUIP, a 5 Ton refurb program; STORQUIP has continued to this date. The events of 11 Oct 84, marked the completion of the 500th refurbished vehicle produced by Base Maintenance, CFB London.

The refurb programs have served two very important roles for DND: the operational readiness and serviceability of the land support vehicle fleets have been enhanced;

BGen J.G.R. Doucet, DGLEM, presenting retired CWO W.D. (Pete) Schussler with a STORQUIP commemorative plaque.

and an estimated 14 million dollars in capital expenditures has been saved by extending the lives of today's in-service fleets. Locally, the refurb programs have injected over one million dollars in salaries into the London area and they acted as an excellent route through which qualified tradesmen can join the Base strength.

Dignitaries attending included: Brigadier General Doucet, DGLEM; Lieutenant Colonel Galea, A/DSVEM; and, accepting the 500th vehicle on behalf of Mobile Command, Brigadier General Wheatley, COS ADM. Chief Warrant Officer R.R. Hockin, CWO W.D. Schussler (retired), and Sgt B.D. Rodgers (retired) were recognized for their significant contributions to the success of the refurb programs.

The event was a real LEME banner waiver — an excellent opportunity for today's tradesmen to congratulate themselves on a job well done.

The marking of RCEME's 40th anniversary is certainly important, and deserves the attention the LEME Branch has devoted to it. Based on the milestones of the past, the anniversary has enabled the younger members of the Branch to establish a stronger 'esprit de corps' and identity. The risk that the LEME Branch will fix its gaze on the past, neglecting today's achievements has been alleviated: CFB London's commemoration of the 500th refurbished vehicle has moved one of today's significant accomplishments to the front page. Well done, London.
ARTE ET MARTE

BGen H.R. Wheatley, COS ADM FMCHQ, presenting CWO R.R. Hockin with a Commander's Citation as recognition of his contribution to the Refurbishment program.

On behalf of Mobile Command, BGen H.R. Wheatley, COS ADM FMCHQ, accepted the 500th Refurbished vehicle from BGen J.G.R. Doucet and Maj H.T. Higuchi, Base Technical Services Officer.

THE NEW TECHNOLOGIES AND THE SOCIETY OF TOMORROW

by Roger A. Blais, ing*

This article is reproduced from the Magazine "L'ingénieur" of April 85.

Summary:

The new technologies offer enormous possibilities because of their spin-off effects in many industrial sectors. They open up completely new horizons, especially in the fields of information and communications. Rapid developments in these fields result in spectacular improvements in performance, both in manufacturing processes and in the products themselves.

The new technologies give rise, however, to serious concerns, particularly with respect to the disappearance of jobs. If we fail to adapt to these technologies or manage them improperly, they can worsen unemployment. The main problem today is that the pace of social innovation is much too slow compared to that of technological innovation. New mechanisms and new forms of social organization are therefore required in order to achieve a better balance between technological supply and demand and to introduce the social changes that must go hand in hand with technological changes and economic development.

Technological change is profoundly affecting industrial structures and causing significant changes in society. This analysis will therefore attempt to describe the new technologies, to convey their systemic nature and to anticipate their repercussions on society. It is particularly apposite considering that, in the words of Paul Valéry, "The future is not in the habit of being what it was." In other words, we must prepare for the future.

A Look Back at Past Changes

The effect of technology has always been to increase productivity in certain sectors. Thanks to economic expansion, it has been possible for other sectors to absorb the manpower thus freed.

Such was the case, first of all, in agriculture and the other primary industries. Mechanization resulted in a large surplus of manpower. These surplus workers migrated to the cities and were absorbed by a manufacturing sector that was then undergoing major expansion. Subsequently, manufacturing industries increased their productivity as a result of automation. Their surplus workers then went to the service sector, which has grown enormously in the past three decades and now accounts for more than two-thirds of the economy. It is worth noting that 80% of the employees in this sector deal with information in one form or another.

Now, with computerization, the service sector itself is in danger of losing many jobs (5). Moreover, the spectacular advances in data processing, telematics and office automation are profoundly transforming the nature of existing jobs.

The new technologies have the specific characteristic of being able to make human tasks easier by improving working conditions (for example, robot welding), by increasing efficiency (data processing), by augmenting human potential (artificial intelligence) and by making nature serve man's purposes (biotechnology). Therefore, the most commercially promising technologies are those of the microprocessor, the man-machine interface, genetic engineering and microbial insecticides (3).

A New Industrial Revolution

The *first industrial revolution*, for which the steam engine was responsible, took place between 1780 and 1840. It began in Great Britain and radically transformed the textile, mining, manufacturing and transportation industries. The *second*, resulting from the introduction of electricity, occurred between 1860 and 1910 and had its greatest impact in the United States, Germany and Great Britain. It led to a great increase in the production of steel and chemical products, the electrification of cities, the expansion of railways and the spread of the telephone and telegraph. It gave rise to the automobile, the airplane, radio, plastics and many scientific instruments.

The *third industrial revolution* began in the 1940s with the discovery of nuclear fission. Aided by vast research and development programs (R&D), it makes possible the exploration of extremes — ranging from the atom to the interstellar spaces. It gave rise to missiles, supersonic aircraft, radar, modern astronomy and nuclear weapons. At the other extreme, it revealed the structure of the DNA molecule and of proteins, led to microelectronics and computers and made possible the world-wide distribution of synthetic materials, television, telecommunications, civil aviation and the automobile. This revolution is far from being over.

Each of these revolutions led to periods of great prosperity. Economic history also shows that the crisis periods between these waves of prosperity have been powerful catalysts of invention (6). A cycle averaging approximately 55 years

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**Roger A. Blais is a professor in the department of industrial engineering of the École Polytechnique de Montréal. He teaches industrial innovation and is pursuing research on the introduction of new technologies in business. He was director of research at the École Polytechnique from 1970 to 1980 and founding director of the Centre d'Innovation Industrielle in Montreal from 1980 to 1984. He now directs the R&D service co-operating with industry at the École Polytechnique.*

seems to mark the periods of great technological activity (figure 1) resulting from these major inventions (8). If history repeats itself, the start of the 1990s should mark the crest of a fourth wave of technological breakthroughs (7) and then usher in a solid economic recovery (2).

The Dynamic of the New Technologies

The technological changes that are under way and those that are about to come are deep and irreversible. They are spreading everywhere and making themselves felt in all spheres of human activity. They constitute simultaneously elements of progress and causes of social disequilibrium. Their dynamism has no precedent in economic history.

1. **Post-industrialism.** The services sector is absorbing more manpower than the manufacturing production sector. The most rapidly developing industries require advanced knowledge rather than large capital investments.

2. **Drastic reduction in costs.** The intrinsic cost of technology has gone down dramatically compared to the cost of labour. For example, in spite of inflation and the higher cost of energy and raw materials, the cost of microtechnology per performance unit is 100,000 times lower than in 1960. Miniaturization and automation have put an end to the historic relationship between the cost of labour and the cost of technology. Technological progess makes possible an exponential growth of output with very little additional manpower. For the first time in history, industry can simultaneously maximize two advantages — high output and low input. This means a reduction in the manpower required for large-volume manufacturing processes. For example, if the transport industry had made as much progress as microelectronics in the past 20 years, a Montreal-Vancouver airline ticket would cost only $2.50, and an ordinary automobile could go 4,250 km on a litre of gasoline!

3. **Increased capacity and reliability.** The new technologies have far greater scope, capacity and reliability than previous ones. The capacity of electronic chips has increased 100,000 times in the past decade. IBM, the world computer giant, has just developed an experimental chip that not only has a memory of one million characters but also operates at a speed of 80 nanoseconds (10^{-9} second). Microprocessors can be programmed and used for purposes ranging from welding metal to cutting cloth, analysing electrocardiograms, recording telephone messages, word processing and preparing a syllabus. A portable microcomputer is 40 times as powerful as the first computer (ENIAC), 10,000 times less expensive, 17,000 times lighter, 1,500 times smaller and uses 2,800 times less energy while producing very little heat. Industrial robots can work 24 hours a day, seven days a week, under very difficult conditions, without taking coffee breaks or holidays, and never complain. It is less costly to replace their modules than to repair them.

4. **Speed of operation.** The speed of computer transactions is now measured in picoseconds (10^{-12} second). Laser memory systems can store all the words in 4,000 sets of 30 complete volumes of the Encyclopaedia Britannica and retrieve any of those words in 8.6 seconds. Fibre optics make it possible to transmit the equivalent of an entire Encyclopaedia Britannica in one two-hundredths of a second over a wire the size of a hair. A letter can be sent anywhere in the world in a fraction of a second. The electronic photocomposition of a large newspaper page can be done in 15 seconds, whereas it would require 22 hours by hand. The speed of fighter aircraft has increased to the point where it has reached its limit: that of going too fast to be able to recognize and hit the enemy target.

5. **Rate of dissemination.** The speed with which the new technologies conceived in the 1960s have been developed, adopted and disseminated is without precedent. For example, electronic calculators have captured 90% of the market in just eight years, whereas the replacement of natural rubber by synthetic rubber took nearly 60 years. While 63 years elapsed between the adoption of the steam-driven cotton gin in Great Britain and its introduction into the United States in 1847, the transfer of a powerful new technology from one country to another now occurs in just a few years. Thus, newly industrialized nations such as South Korea, Taiwan, Singapore, or even Mexico or Brazil can quickly acquire completely new technologies. Because of their cheap and abundant manpower they become formidable competitors. In general, it can be said that each generation of technology (measured in years, not in decades, as in the past) is cheaper and more efficient than the preceding one.

6. **Transitions and substitutions.** Many mechanical or electro-mechanical devices (for example, cash registers, watches, telephone switchboards) have been replaced by electronic systems whose manufacture requires far less labour. Thanks to the progress of biotechnology, the day is not far off when micro-organisms will perform enormous amounts of work, and at very little cost. Major substitutions are also taking place, such as the replacement of metals by plastics whose production requires less energy and manpower. When it is

possible to make alloys or, better still, plastics that are superconductors at room temperature, copper will lose practically all its current value.

7. **Snowball effect.** The combined effects of advances in microelectronics, biotechnology and artificial intelligence will no doubt lead to a wave of innovations whose scope will exceed that in all previous industrial revolutions. We are entering an asymptotic era in which knowledge will increase exponentially. Just as electricity powered the second industrial revolution, the microtechnologies are creating new horizons, not only for industry but for all of society. For the first time in the history of the human race, completely separate fields of knowledge are overlapping, intersecting and combining to produce a synergy leading to great transformations. For example, microelectronics powers microprocessors, and the latter add to the progress of science. Science, in turn, helps to create a new generation of microprocessors. The same snowball effect occurs at the interface of biotechnology and electronics: the combination of quantum chemistry and computer graphics makes it possible to design new molecules such as the synthetic enzymes (synzymes), just as the power of computers has opened the way to genetic engineering. The same is true of the man/machine interface with fifth-generation computers: machines already exist that can identify several hundred Japanese or Chinese ideograms, even if written by hand, and recognize the human voice in the form of syllables or an individual's vocabulary. It will not be long before it is possible to ask a computer all sorts of questions or give it verbal commands and receive a reply by synthetic voice. In the 1950s and 60s computers were used to process numerical data; since the 70s they have been used to process all forms of information. Between now and the end of the century they will become more and more *intelligent* and will make it possible to process knowledge itself. They will distinguish between the meanings of words, support hypotheses, apply the rules of logic, analyse complex facts and be able, to some extent, to learn by themselves. Never before could machines show evidence of judgment and intuition. No steam engine could play chess, nor could any slide rule engage in conversation.

8. **Systemic nature.** According to Amesse et al (1), the new technologies are characterized by their systemic nature, that is, they provide many points of intersection with various fields. This leads to a change in the entire industrial structure which affects not only the producers but also the distributors and users of these goods and services.

9. **Strategic materials.** The new technologies may cause certain materials to lose their strategic character or confer an entirely new strategic character on familiar materials. For example, the synthetic fuels developed by the Germans during the Second World War helped to mitigate oil shortages. The same motive led to the development of nuclear power, and more recently to the study of "soft," renewable energy, in order to reduce the impact of oil "blackmail." As another example, silicon, the most abundant element in the earth's crust, has become a strategic material for the microelectronics industry. In its ultra-pure, monocrystalline form, it requires very highly-developed manufacturing techniques and commands a price 60 times higher than that of metallurgical-quality silicon metal.

10. **Destructive power.** For the first time in history, mankind has the technical capability to destroy everything on the planet. The same technological determinism that gave rise to uranium, plutonium and the neutron bomb prevails at the negotiations between the superpowers. The same set of circumstances bedevils war in space and the conquest of the ocean depths.

11. **New division of labour.** At the beginning of the century, when horse-drawn vehicles were replaced by the automobile, many workers were displaced, but jobs in this sector increased dramatically. In the last century more than 75 per cent of jobs were in agriculture; today the figure is only five per cent. This five per cent, however, produces more food than the entire population can consume, and farmers are ten times as rich. On the other hand, although steel workers are ten times more productive, they are not ten times richer. In this case, *labour and capital are dissociated.* It is not surprising, therefore, that in similar cases workers are frequently opposed to technological change. A new global division of labour results from these changes. When Japan and South Korea were able to capitalize on liquid crystals and microelectronics in manufacturing watches and clocks, Switzerland and West Germany lost a large share of this lucrative market and suffered a heavy loss of jobs. Their skilled workers were displaced, while the Japanese and Koreans profited. In other words, the loss of jobs in one national industry is not always offset by a complementary increase in jobs, as was true of the automobile industry in the United States at the turn of the century.

In sum, the principal new technologies offer a set of unequal benefits: increase in productivity; economy of raw materials, energy and space; high cost/benefit ratio; ease of maintenance; reduction of physical effort and mental stress; ease of learning; mutual synergistic effects; repercussions on many sectors and ease of adoption by many countries (3). However, they require far less manpower than previous technologies, thereby creating unemployment that can be absorbed only by the new economic activities they produce. Furthermore, they require the retraining of workers and heavy investment in R&D.

The Repercussions of the New Technologies

Modern technology has a great variety of aspects. It is like a series of incoming tides, each one higher than the previous. Its current is discontinuous, and it comes in suddenly, without warning. We were unprepared for it and must now adapt quickly if we are not to lose our valuable assets.A way must be found, however, to tame its progression. It opens up new horizons and hints at new ways of living, offering great possibilities that some, at times, regard as disturbing. Everything will depend on what we make of it.

The rate of technological change is accelerating. The number of inventions coming on the market continues to increase while the time required for their introduction shrinks. When a technology has reached its state of maturity it is exhausted and is then replaced by a more powerful technology. All too often this transition is not harmonious and takes place without adequate preparation. Entire industries disappear and others take their place. Such anarchic development places severe constraints on ordinary people. Technology has become a key factor in the strategy of dynamic businesses. In order to remain competitive, many of them invest more than five per cent of their sales dollars in research and development. The businesses with the best job-creation record are small and entrepreneurial in nature, and the most successful of these are the ones that take advantage of the new technologies in one way or another.

Modern technology has become a political instrument. Since it is a commercial commodity for which countries bargain actively, governments are taking increasing interest in it (4). Some governments require transfers of technology in return for the sale of their natural resources. The governments of most industrialized countries attempt to promote technological innovation by a variety of methods. Miniaturization, a consequence of microelectronics, represents a break with all industrial tradition. It permits exponential growth in output with relatively small investments in capital, energy and labour. Thanks to modern technology, we are already living in an *information society*. Unfortunately, the gap between those who have a great deal of information and those who have very little (5) is growing. A high level of education is becoming the ticket to a satisfying job. The dropouts incur severe economic and social penalties. What is at stake in technology is becoming so complex that politicians have serious difficulty understanding the *why* and the *how*. Nevertheless, power goes to those who can control technology and eludes a poorly informed electorate. The political process itself begins to erode when the making of decisions with respect to new technologies becomes the prerogative of the bureaucracy (5).

Conclusion

Economic growth has dominated our lives for so long that we consider it a right. Now, under the impact of the new technologies, the economic arena has changed considerably and become more complex, and the stakes are uncertain.

We are not lacking in resources to deal with crises, however. We have myriad powerful technological innovations, but that is not enough. The pace of social innovation has to accelerate considerably if we are to solve the agonizing split between the creation of new wealth on the one hand and the creation of new jobs on the other (4).

In conclusion, it is therefore appropriate to quote Reich (9):

> Economic managers in America and Britain have come to measure the health of their national economies in terms of abstract rates of inflation, interest, unemployment, trade balances, investment, and productivity. They view the world through the eyes of bankers and traders — wedded to abstraction and thus prone to sacrifice the real to the symbolic and the future to the present. They ignore the importance of structural change and adaptability to the nation's economic health and the central role of political choice and compromise in making such change possible.

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THE NEW ADDITION TO THE "LEME FAMILY" MOC 441 MATERIALS TECHNICIAN (MAT TECH) TRADE

by LCol L.W. Hyttenrauch (former Trade Advisor)

BACKGROUND

In the 1970s it was recognized that the training received in the Air oriented workshop trades (MOCs 561 Mtl tech, 562 Machinist, 563 Ref tech) did not fully meet the needs of the Land environment. This was confirmed by the Air workshop Trades and LORE Trades Occupational Analysis completed in 1981 and 1983 respectively. These studies also found that considerable morale problems were caused by bouncing tradesmen between the Land and Air environments. The only reasonable solution was to split the materials related trades of the Air element into separate Air and Land trades. The LEME (then LORE) Branch decided to amalgamate the various skills into a single Materials Technician trade of 250 tradesmen. The trade is responsible for the following Land functions.

- welding
- metal work
- auto body repair
- fiberglass
- textiles
- machining
- refinishing
- rough carpentry

As with other LEME Branch trades the MAT TECH trade is employed across all the commands as indicated in the following table:

EMPLOYMENT BY COMMAND

Command	Percentage of MOC 441 Trade Employed in Command (%)
FMC	50
CFE	15
AIR COMD	13
ADM (MAT) FIELD UNITS	13
CFTS	8
MARCOM	1
TOTAL	100%

TRADE IMPLEMENTATION

IMPLEMENTATION DATE

The MAT TECH trade was officially formed on 1 Jan 85. Rebadging ceremonies took place at every major base in Canada and CFE as indicated in the following pictures.

REBADGING CEREMONIES CFB GAGETOWN

L TO R *MCpl Stuart, Cpl Essleton, Cpl Tibbel, Wo Sommers, Cpl Daigle, Mcpl McEachern, Cpl Nearins.*

Comdt CFSAOE Col Hanson, Pte Trepanier

CFSAOE

Comdt CFSAOE Col Hanson, MWO Fulton.

FMC HQ

Lcol Walsh, SSO Maint, MWO Landry, (just prior to promotion), Col Pergat, DCOS Log.

REMUSTER PROGRAMS

The personnel requirement for 1 Jan 85 was as shown in the following table. The other LEME trades are shown for comparative purposes.

RANK COMPARISON IN 400 SERIES TRADES

RANK	TRADE			
	411 VEH	421 W TECH L	430 SERIES ELM/FCT/FS	411 MAT TECH
CWO	34	9	10	1
MWO	105	21	19	3
WO	176	40	32	10
SGT	307	52	48	33
MCPL	522	62	66	40
CPL	384	57	55	74
C-P	1142	126	96	89
TOTAL	2670	367	326	250

To meet the target of 250 male personnel a voluntary remuster program was implemented and approximately 170 tradesmen from the MOC 560 series and YTEP graduates joined the ranks of the LEME Branch as MAT TECH tradesmen.

At the end of the first remuster some of the MOC 560 series were significantly overborne. A second remuster program was therefore required to ensure both the MOC 560 series trades and the MAT TECH trade remained viable over the five year transition period. This second remuster program to recruit addition MOC 560 series technicians will close while this addition of the EME Journal is going to press. Early indications are that at least another 30 remusters will occur, bringing the MAT TECH trade total to over 200 and redressing the overborne state in the MOC 560 series trades.

To ensure the trade receives its full complement of personnel by 1990, the CF will recruit between 30 to 40 MAT TECHs per year commencing this year. The trade will be open for annual remuster as well as recruiting "off the street".

TRAINING

The major challenge in the development of this trade is in meeting the conversion and steady state training requirements. As it stands at this time, all 200 personnel who have remustered will go on conversion training within the next two years. Steady state training commenced on 1 Jan 85. Training information is depicted in the following table:

MAT TECH TRAINING

COURSE	SERIALS FY 85/86	FY 86/87	TRAINING DAYS PER COURSE
STEADY STATE			
TQ3	2	2-4	176
TQ5	0	2	91
TQ6A	0	2	37
TSQ 441.01 (MACH)	1	2	87
TSQ 441.02 (ARMD WELDING)	1	2	30
CONVERSION			
561 TQ314	2	0	43
562 TQ314	2	0	60
563 TQ314	1	0	69
561 TQ5	1	2	60
562 TQ5	1	0	92
563 TQ5	1	1	102

All MAT TECHS employed in machining and welding of combat vehicles will be TSQ qualified.

ESTABLISHMENT REVIEWS

All commands are actively reviewing their establishments to ensure those functions which are best done by the 441 trade are in fact being done by MAT TECHs and that the workload and resultant establishments reflect this situation. Did you know that the most senior MAT TECH rank in FMC and CFE is "Sergeant" and this is a Land trade!

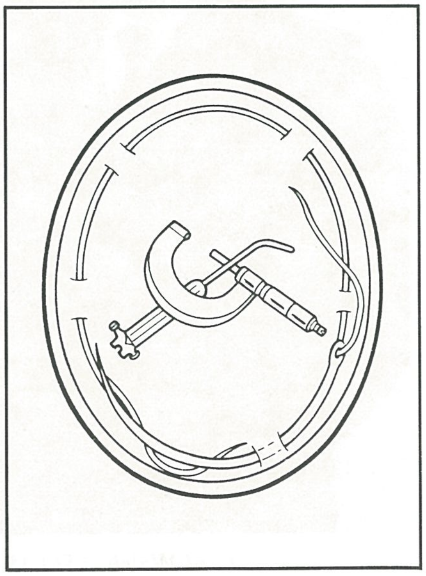
ADDITIONAL INFORMATION

PERSONNEL UPDATE

As mentioned the MAT TECH was formed on 1 Jan 85. On 2 Jan 85 the then current Assistant MAT TECH Trade Adviser MWO Ron Landry was promoted CWO and as such became the senior technician in the trade.

TRADE BADGE

Senior members of the MAT TECH trade submitted the following trade badge design for Branch consideration/approval. The concept is currently being reviewed and sample cloth embroidered badges produced. The design incorporates the three previous trade functions represented by the torch, michrometer and needle, interwoven into one trade.



LGen Belzile, Commander FMC Congratulating CWO Landry on promotion.

FUTURE OF TRADE

The future of the MOC 441 trade is in your hands. Those that are in the Branch or associated with EME business are challenged to employ all the knowledge and skills within the MAT TECH trade. You are asked not to live in the past Air concept, where three distinct trades existed. Use the flexibility of knowledge and skills to your advantage.

There is no doubt in my mind that the new members of the LEME family will carry out their profession in an exemplary fashion and add to the Branch credibility that already exists.

Your opinions and future suggestions for improvements to the trade are always welcomed. You are encouraged to use the technical chain of command and pass these comments to either the MOC 441 Trade and/or Assistant Trade Advisor.

In closing I would personally like to thank all those who have been involved in the implementation phase. Without your dedicated efforts it would not have been possible to succeed in establishing the MAT TECH trade.

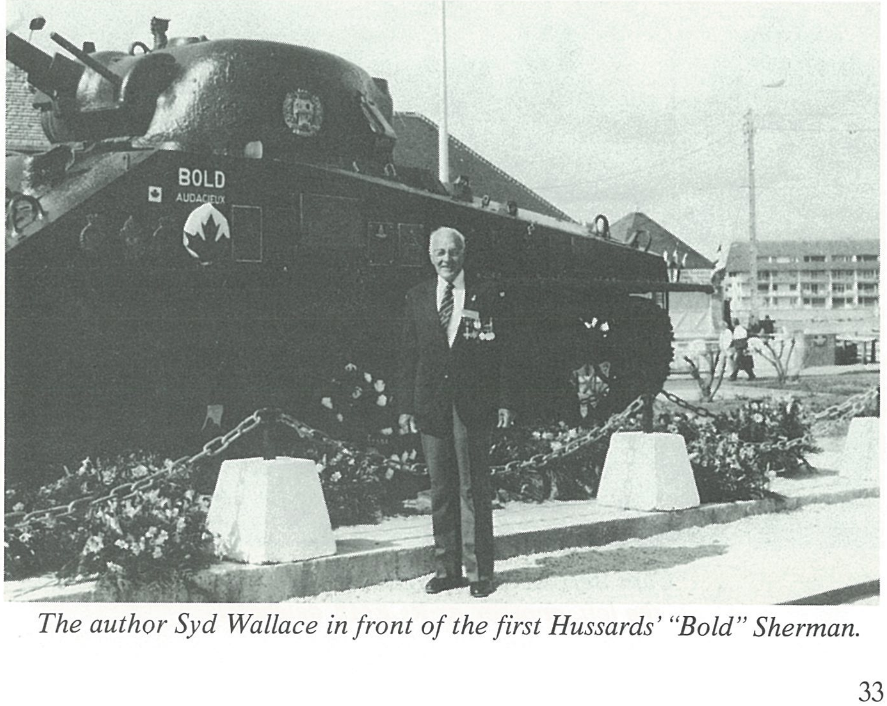
THE 40TH ANNIVERSARY OF THE "D" DAY LANDINGS

by Sydney J. Wallace,

1984 marked the 40th Anniversary of the "D" Day Landings. Every year corps, regiments branches are asked to send representatives to attend the ceremonies which take place on the beaches of Normandy.

Capt (Retd) Sydney Wallace represented RCEME at the 40th Anniversary celebrations. He sends this report.

Sometimes something memorable happens in our lives which was unsought and unexpected. Being nominated to represent RCEME on the Fortieth Anniversary of the "D" Day landings was such for me. It was a privilege for which I felt others were more deserving and suited. It was an honour to represent the Corps



The author Syd Wallace in front of the first Hussards' "Bold" Sherman.

which I sincerely appreciated.

In early June 84 as each member of the Delegation journeyed to the assembly point few, if any, had an inkling of what this 40th Anniversary Pilgrimage was to mean. As we gathered you heard "I'm RCEME", "I'm HLI", "First Hussar", "Fort Garry Horse", "North Nova","Air Force", "Navy", etc. With this identification came a strange nostalgia. You again felt that all-important feeling of identity. You remembered once again that strong sense of purpose.

As we journeyed to Paris and prepared for the trip to Normandy the feeling of identity increased. We again wore the "Canada" patches and were as proud to wear them today as we had been forty years before.

The children of Authie and the honourable Campbell Bennett.

As we traced our journey to Caen on the map, all were recalling place names which had special meaning for their unit and for themselves. My own thoughts returned to men and experiences in Vaucelle with the AWD supporting the Canadian AGRA. To best serve that AGRA we were located, by design, well forward. We were a target for shelling and night bombing. In spite of dispersing men and vehicles at night, we still experienced casualties of both men and equipment. This did not detract from the effectiveness of the AWD under the leadership of WOII Jim Millen. He was a professional in the best sense of the word. He made effective decisions, not necessarily by the book.

As an example, when a 155 mm gun came in with a badly scored obturator seat, he had it welded and hand fitted because he knew there were no replacement barrels in the theatre. He was well aware that such a repair was forbidden. This barrel lasted to VE Day.

A few days before Operation Goodwood — Monty's unsuccessful attempt to break out — an officer from an armour regiment came to the AWD requesting assistance. He had sent 38 of his unit's Nineteen Sets to the rear for recalibration. On the way back their 15 cwt had hit a land mine. He had been told all sets would have to be replaced. He said none were available, could we help him. Millen instructed S/Sgt Bob Baillie of the telecom section to pick up the sets, evaluate the damage, and report how many he could make serviceable by cannibalizing the badly damaged sets and using what spare parts he had available. Baillie reported that a number of sets could be recovered. He and two other telecom craftsmen worked through the night. By afternoon the next day 33 sets were repaired and calibrated. This was typical of the efforts of RCEME craftsmen.

As we entered the Caen we knew only as a pile of rubble few, if any, could find recognizable land marks. The city had been totally rebuilt and appeared much larger. We saw only one church still bearing the scars of battle. A monument to the Battles of the Marne, as we remembered it, stood surrounded by ruins and rubble. Now its shell-pocked column is the only evidence of the violence of June 1944.

Capt Bert Hargrave MBE MP, 4th from the left, another ex-RCEME delegate.

When we arrived at the Courseulles landing beaches most could identify only one building with certainty. There was still the shell-scarred seaward face of the concrete shield of an antitank gun which covered the beach approaches. Today at various points along the shore there are monuments to the infantry and armour units which lead the assault, the HLI, the Regina Rifles, La Chaudiere, the First Hussars and all the others.

The Delegation took part in wreath laying and unveiling ceremonies at St. Aubin, Courseulles, Cintheaux, Caen, St. Andre-sur-Orne, May-sur-Orne, Buron, Buissons, Authie, Carpiquet, and the Canadian War Cemeteries at Beny-sur-mer.

At each ceremony all the local people were there, expressing their thanks for their liberation in 1944. Following each function the Delegation and other veterans enjoyed their friendly hospitality.

All the services were emotional experiences but three stand out in particular: the Abbaye D'Ardenne, Authie and Beny-sur-mer. The monument unveiled at Abbaye D'Ardenne is in memory of twenty Canadian prisoners murdered in June 44. Most were North Novas or 27th C.A.R. This service in the peaceful grounds of the Abbey was intensely emotional for everyone. None could hide it. It was so incongruous that such an inhuman act could take place here.

At all ceremonies children from the local school were present. In Authie there was something special about their presence. I have a photograph of Mr. Bennett Campbell with a class of beautiful small children, the best of all I took. This photograph for me was particularly significant for it was near here that I saw, as I drove up to an RCOC Field Park, two small children wounded by strafing enemy fighters. They were the only casualties other than some vehicles.
(Picture #3)

Queen Elizabeth and Prime Minister Pierre Trudeau laid wreaths at Beny-sur-mer. At all other ceremonies the Minister of Veterans Affairs, the Honourable W. Bennett Campbell, acted for the Government of Canada.

The padres with the Delegation, Father Joe Malone and Rev. Ed. Horton had a special place among us, just as the padres had in 1944. In truth, their brief offerings reached the very heart of our purpose in being there. Each service ended with reflective and expressive poem by Lawrence Binyon, quoted at the end of this description of the "D" Day Anniversary.

The climax of this pilgrimage was the wreath laying service at the Canadian War Cemetery at Beny-sur-mer. Not only was the Delegation there but also many other veterans and their wives, and a large number of French civilians. The Royal 22e Regiment was the ceremonial regiment. They were perfectly turned out, precise, a credit to Canada. The pipe and drum band created that parade atmosphere we all remembered so well. It was against this background that all regiments and services represented laid wreaths in memory of comrades in this and other cemeteries.

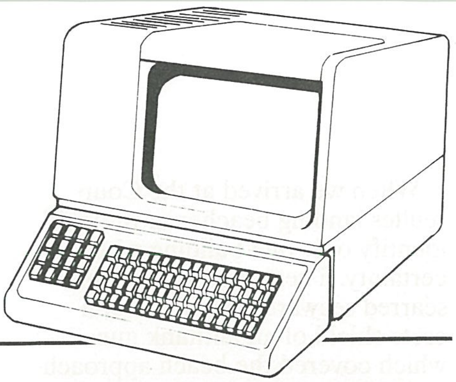
As impressive and emotional as the ceremonies were, it was not until you walked the long lines of grave markers that the full meaning of this visit came upon you, particularly when you saw names you knew. Lt. Col. Worthington was killed Aug. 8, 1944. We were in ROTC together in 1935. His brother, Major Worthington of the same armour regiment lay two graves over — killed Aug. 10.

As you pass each stone and read the name, age and unit, you wonder what right you have to be standing there, having enjoyed forty years of good life, and they paid the price.

All services have reason to be proud of their contributions to the final Victory. They earned respect. The honour must go to the infantry and armour for they were the attacker, it was they who defeated the enemy, only they knew what it was to exist at the very face of battle on the killing ground.

They shall not grow old
As we are left to grow old;
Age shall not weary them,
Nor the years condemn.
At the going down of the sun
And in the morning . . .
We will remember them
(Lawrence Binyon)

information corner



LOMMIS MK II MODIFICATION STATUS (MS) SYSTEM

by W.T. Dexter

BACKGROUND

1. In early 1971 LOMMIS was tasked to design an automated modification reporting system that would eventually replace the burdensome manual system maintained by transport personnel. At the outset only a few variants of the APC, ¼ ton and 2½ ton families were selected by the LCMM with a limited range of applicable modifications for the trial period of automated recording. Both systems were maintained in parallel with the manual system based on the DND 613 Modification Record Log and the automated system based on LOMMIS programs and reporting. The automated trial results proved satisfactory and in May 1975 DTO cancelled the manual reporting system.

SYSTEM DESCRIPTION

2. The LOMMIS MK II Modification Sub-System covers registered equipments which include SMP vehicles, AFVs, standard commercial equipments, oversnow vehicles and more recently, the MILIPAC. The system requires real CFR numbers and tracks only CD and CF modifications as requested by the LCMM. Reporting is done on the CF 1020 work order following the completion of the modification.

DETAIL

3. The system is designed to meet any of the following cases of modification applicability:

a. all equipments within a specified ECC;
b. all equipments identified by manufacturer's model and year within a specified ECC;
c. specified CFR number within an ECC; or
d. geographical location ie Canada only, CFE only or both.

4. The applicable modification instructions are identified in the LOMMIS MK II Data Base which is updated by LOMMIS MK II Input Transactions or CF 1020 by:

a. adding a new modification CFTO series or a new modification within an existing series;
b. deleting an existing modification series and its associated modification(s);
c. deleting an existing modification number within a modification series;
d. changing the priority status of a modification; or
e. changing the completion status of a modification.

RESPONSIBILITIES

5. In order to achieve maximum effectiveness from the LOMMIS MK II Modification System, the cooperation of all levels of management is required. The responsibilities of the various levels are listed hereunder.

a. LCMM — advising DLES 5 of modifications that are LOMMIS reportable in order to update the data base, reviewing the applicable MS output reports for accuracy and completed modifications.
b. CHQ — reviewing MS output reports with a view to evaluating the workshops and units within their command regarding their modification status.
c. WKSP/Maint PL — reviewing the MS 2 output report to determine which modifications remain outstanding, which modifications have been completed but not reported, and taking the necessary action to report completed modifications via CF 1020.
d. DLES 5-2
   — ensuring the data base is updated upon request of the LCMM.
   — monitoring output reports to ensure accuracy of information.
   — reviewing error and observation lists applicable to the Modification System.
   — liaison with LCMM, CHQ and Workshop/Maint Pl to identify problems within the system.

PROCEDURES

6. LCMMs must inform DLES 5-2 of all reportable modifications prior to the issue of the modification instructions to the field. The mandatory information required to update the modification system is listed hereunder:

a. equipment configuration code (ECC) of equipment if the modificaton is applicable to all CFRs within the fleet;
b. ECC, manufacturer's model and year if the modification applies to only a particular model with the configuration;
c. CFR number of equipment if the modification is applicable to only specific CFRs in the fleet;
d. the complete CFTO number of the modification including the priority A, B or C as applicable; and
e. geographical applicability ie applies to Canada only, CFE only or both.

7. In keeping with the above,

if the LCMM wishes to delete a modification from the system by virtue of a cancelled instruction, or change the status of a modification record because of a superseded instruction then information similar to that listed above must be provided.

8. Upon receiving a request from the LCMM for modification reporting, DLES 5-2 will prepare the input transaction to add, delete or change the modification system depending on the desired action.

9. It should be noted at this point that all modifications are not LOMMIS reportable. Only those modifications listed as outstanding in the MS 2 Output Report are to be reported when completed. The following action is required by reporting units upon completion of modifications:

a. report any complete modification shown as outstanding on the MS 2 Report by entering the complete modification CFTO number on CF 1020D copy 3 or CF 1020Q copy 1.

AUTHORITY

10. The authority to add, delete or change a modification rests with the LCMM. DLES 5-2 will only amend the modificaton system on the request of the LCMM. Constant liaison between DLES 5-2 and LCMM must be maintained prior to any changes being made. DLES 5-2 does however, have the authority to make the changes when necessary related to system problem, system inputs and system maintenance.

11. The policy regarding modification reporting is presently under review by DLES 5 staff. When a policy decision is made all levels of the EME System will be notified.

REFERENCES

A. C-04-025-001/AG-000 Annex F
B. C-04-030-005/AG-000 Part 6
C. DGLEM Division Instruction 10/83

NEWS AND VIEWS FROM DSVEM

by Divers Personae

It all started with a memorandum signed by the Editor of the Journal on 5th February, 1985 informing the various directors and trade advisors within the Director General Land Engineering and Maintenance Division that contributions were required for the latest edition. The Director Support Vehicles Engineering and Maintenance (DSVEM) annotated the memorandum stating that a certain staff captain was 'it', but section heads within his Directorate "may wish to assist". You should have seen them run for cover!

That staff captain decided one long, boring article on some technical aspect of his work might be of vague interest to himself, but probably not anyone else, so a new approach was required. Using all his tact, guile and even threatening blackmail — not necessarily in that order — he suggested short items from each section so that interesting information could be passed to those 'working at the coal face' from those 'working at the pit head'. Instead of publishing straight technical information on everyday matters, which is probably better transmitted by CFTOs anyway providing one has the knack of understanding the coding system, the contributors might wish to put forward some personal and, perhaps, provocative ideas. There would be the usual disclaimer about "not representing official DND policy" and so it was thought this chance for budding authors would be too good to miss . . . however, it would be wrong to bore you with some of the excuses put forward — most were unprintable anyway.

To cut a medium story shorter, persuasion was eventually successful and the articles follow. It is hoped that, firstly the Director, and then the Editor, do not cause too much to be censored. If so, our contributions are likely to be somewhat disjointed and rather short.

DSVEM

It would be useful to call this element "The Headquarters" but that would be rather euphemistic, especially as it only consists of the Director and his secretary. Now that is not to run them down in their importance or usefulness — let's face it, somebody has to be in charge. Another very important point, our talented Director completes certain parts of all our PERs and his attractive secretary types them, so they do have critical jobs at certain times of the year and we have to bear this in mind. In addition to that annual chore, they control some 39 military and civilian engineers, technicians and hard workers who try to ensure the equipment for which we are responsible works as well as possible, or alternatively, to our satisfaction. In spite of our appearance to the outside and real world, outside NDHQ that is, there is some semblance of order in this Directorate, notwithstanding our manning shortage due to poaching by the Project Management Office (PMO) of the Military Operation and Support Trucks (MOST) — that's right, they seem to have MOST of the manpower.

We would like this publication to be one way of getting our concerns known throughout the Branch and hope that we get feedback on the problems, successes and concerns of craftsmen in units. Remember that Life Cycle Materiel Managers (LCMMs) do not have daily contact with the equipment. Too often we work in a vacuum having to rely on the old adage 'No news is good news' when, in fact, we are sure there are problems, but nobody has 'put us in the picture'. We would prefer to get information early, perhaps by an incorrect manner, rather than late information via the normal chain of command route; but we suspect this would be the exception rather than the rule. If in doubt, use your initiative and inform us, getting your hand slapped later in the unlikely event that NDHQ cannot smooth the ruffled feathers of the staff at other headquarters.

Regarding personalities, LCol E Galea departed on 26th July, 1984 to become Deputy Project Manager MOST located in Hull. We wish him well in that appointment and thank him for his guidance during the two years when he was filling the Director's hot seat. Shortly thereafter Col JA Boucher arrived and is now firmly in control — hence this article. Furthermore, DSVEM plans for a major Journal contribution in one of the next issues, so it is hoped these articles will set the scene and become a continuing event to pass the word about what has happened, is happening and will happen — something to assist us all in performing our various jobs in a more professional and effective manner.

The only other major item of news is the impending move of some 2,600 lucky souls to the Louis St. Laurent Building being constructed in Hull. When is the move? It is planned for September, but the date is subject to a sweepstake — tickets available from . . .

DSVEM 2 – STANDARD MILITARY PATTERN VEHICLES Commercial Utility Cargo Vehicle (CUCV) Procurement, or Fast Action by DSVEM 2 and DPSL 2.

In October 1984, a proposal was raised to procure troop/ cargo carrying vehicles for Communication Reserve (Comm Res) units under the budget which had been earmarked to enhance our readiness and sustainability (R&S). The project was given priority approval because the Comm Res is at present holding 66 old 2½ ton vehicles and they are only receiving 21 new 2½ ton vehicles. This project was therefore approved to meet the shortfall in lift capacity created by removal of the old 2½ ton vehicles from Comm Res units. Although the proposal called for 42 standard commercial vehicles of 1 to 1¼ ton capacity, discussions between the staffs in Director Communications and Electronics Systems Requirements (DCESR), Director Procurement and Supply Land (DPSL) and ourselves indicated that the best option for the Comm Res would be the CUCV which is being produced in significant numbers for the US Army. Supply and Services Canada submitted a 'Request For Proposal' for the 42 vehicles and GM advised that they could supply the vehicles through Oshawa at a cost of $22,291 by 22 March 1985 and in fact 41 of the 42 CUCVs were delivered to Oshawa by the first week of March. This cost is slightly higher than the cost of an equivalent commercial vehicle; however, it offers the three following advantages — it is a partly militarized vehicle which will enable the Comm Res to operate radios; it meets the standards of Canadian SMP vehicles; and it could be introduced into the Army vehicle inventory as an SMP fleet should it be decided that it is necessary to make additional purchases of CUCVs to meet other requirements.

One might call the CUCV an updated version of the Canadian 5/4 ton as far as the frame is concerned; but there the similarity ends. Its engine is a GM 6.2L diesel and the front axle is a 4500 pound Dana/Spicer instead of the 3900 pound axle used in the Canadian 5/4 ton. As far as we can ascertain the CUCV will accept all 5/4 ton SEVs. The one area in which it is not compatible with the Canadian 5/4 ton is in the area of the slave receptacle — Canada uses the two pin or Bendix system whereas the US has recently reverted to NATO standard or single pin receptacle. It should be noted that GM admits that in their design of the CUCV, they made use of the lessons learnt by GM Canada/DND in the production of the Canadian 5/4 ton fleet. The military modifications incorporated into this vehicle are multi-purpose towing eyes, NATO standard pintle, brush guards, blackout lighting, "single pin" slave receptacle, trailer wiring receptacle, diagnostic connector assembly for STE/ICE, cargo tie downs, bench seats in the cargo compartment, 100 ampere alternator, NBC kit provisions, M 16/14 weapon holders, and heavy duty in-cab heater defroster.

These vehicles will be supported as standard commercial vehicles except for the US Army modifications (i.e. blackout lights, etc) until the remaining R&S projects are staffed and additional vehicles are procured. Consequently, these vehicles will be supported in the following manner:

a. DSVEM 2 will produce an ELD, check lists, etc;
b. authority has been obtained to use the US TMS and to distribute them only in the english language;
c. Master Repair Agreements will be used by LEME workshops to carry out second or third line repairs;
d. If LEME workshops wish to carry repairs in-house they will have to obtain spares through base supply organizations by means of Gpos; and standing offers
e. spares for the US Army modifications which cannot be obtained from commercial sources will be scaled and placed in the CFSS.

One 'reference' CUCV is also being purchased as part of this contract which will not only enable DSVEM 2 to keep abreast of developments in the light SMP field, but also help solve any technical problems which may arise with the Comm Res vehicles.

DSVEM has been advised that there may be additional requirements for CUCVs for other R&S projects, however, GM has stated that the company plans to cease production in April 1986 because it plans to change its product line and must retool the plant. Perhaps consideration should be given in purchasing spare CUCVs to support the Regular Force as 5/4 tons are destroyed by accident or become uneconomical to repair. A one time purchase of CUCVs could be made if requirements are made known and approved in time. We are working on this idea.

DSVEM 3 – ELECTRICAL POWER EQUIPMENT

Understaffed and overworked — if you have heard this expression before it is not that we are trying to invent something new because it's the truth. Lack of time to spend on anything but the planned purchase of the new family of generator sets prevents more than just a few lines to state that we will provide more information in the next issue, especially as the details will have become firmer.

One item which can be mentioned was a recent demonstration with the new, silenced, small, portable generator. We set it going in the middle of a wood at night, closed the somewhat camouflaged silencing box, walked away a few metres to determine the noise level and still have not found it!

DSVEM 4 – COMMERCIAL AND AIRFIELD GROUND SUPPORT VEHICLES

Our section consists of a small group of hard working LCMMs and Equipment Maintenance Managers responsible for the technical well being of the Commercial Support Vehicle Fleet, comprising load and personnel carrying vehicles, material handling equipment, mobile engineering equipment, airfield support equipment and, last but not least, fire trucks.

Some of our numerous tasks include: preparing the technical specifications, based on the users Statement of Requirement, for contract demands and evaluating submissions from the contractors; approving and distributing repair and spare parts manuals; arranging initial training on new vehicles; coordinating logistic support requirements, initial provisioning and scaling for the Field Force standard commercial fleet; and planning equipment replacement schedules based on age for those vehicles replaced individually, and usually in the case of Field Force vehicles replacement of the fleet.

Other important functions are monitoring vehicle fleets for abnormal downtime or excessively high repair costs; introducing and distributing CFTOs, equipment check lists, maintenance bulletins and various other technical publications. We also provide technical expertise to Supply System item managers and locate sources of supply for older or unusual equipment spare parts.

Without input from the users and maintainers in the field in the form of good statements of requirement, attrition warning reports, unsatisfactory condition reports, technical failure reports, and messages or telephone calls warning us of potential problems it is difficult, if not impossible, for us to do our job effectively. So, please keep in contact — part of our job is to help you.

I hope this brief article has given you some insight into our Section's 'raison d'être' — the efficient management of the commercial support fleet. Just remember that we need your input, and without it we are like a ship without sails.

DSVEM 5 – SPECIAL EQUIPMENT VEHICLES

Equipment acquisition is normally a long, tedious and bureaucratic process from the time when the user decides what he wants, then getting the money to pay for it, to when the manufacturer produces prototypes for trials and testing, and finally during the production run when equipment starts being deployed to unit. That is the system in basic terms and to give an example of the time taken in a major project, for the Canadian Patrol Frigate the time interval from the award of the contract to build the ships until the first delivery, it is probably going to take nearly six years. So you can appreciate that things do not happen overnight. There are 'off the shelf' purchases which tend to have short time intervals — the recent acquisition of the Challenger aircraft for Air Command, and the article from Section 2 demonstrate this point.

Now you are probably wondering what this is leading towards. It will be demonstrated that equipment can be procured at a rapid pace, even when design and development are required, providing the user can decide what is needed and then not change his mind apart from, perhaps, minor alterations.

On 17 December 1984, a meeting was held at HQ Mobile Command and it was decided to modify some generator trailers needed on Exercise Rendez-vous 85. The development process was started straight away and, over Christmas mock-ups and prototypes were devised, refined and produced, and finally on 23 January 1985, were displayed to some of the NDHQ 'hierarchy' and to personnel representing the field units. From these prototype and concept models, changes were made and now design could be attempted in detail. As the work progressed, snags were hit, questions posed to the users, answers provided, problems solved. At the same time as the design and development were being brought towards a final version, a contract was awarded to produce the detailed engineering drawings and to write the CFTOs which wil allow the 'EME guys' at field units to undertake the modifications. Separately, another contract was being put in place to allow production to start.

At the end of March, it seems as if we have achieved half of our mission — the under-floor gasoline tank kits for the generator trailers are on their way to units via CFB Wainwright, but the complementary stowage kits for the communication detachment stores probably will not be complete until April. Nevertheless, we believe it was a brave attempt to provide the user with his requirement.

Several lessons can be learned from this example: decide what is needed early enough (two months is likely to be too short a time frame except for very simple production tasks); select and maintain your aim (this will provide the best chance of success, even when all other events seem to be against you); all plans are likely to be modified because of events outside your control (the delay in delivery of items for the kits which had to be bought from external sources); use initiative and be adaptable when problems present themselves; and generally — "Go for it!"

As mentioned earlier, the amount of time taken during procurement is usually long by any standards but, we hope this example of the modifications to generator set trailers has indicated that NDHQ can acquire equipment at short notice. One must realize that in order to be cut, often by liberal interpretation of procedures and systems, and on contraction of many hours of work which is normally spread over several months into a few days. Consequently, the pressure on other supporting departments has to be intense, and this effort can be invoked occasionally but do not try to do it too often or you will soon lose your friends.

Now we come to the competition phase of the article. The staff of DSVEM 5 offer:

a. Prizes to any unit which can produce evidence to confirm that they hold at least one 1¼ ton SEV which is in its original CFTO configuration; and

b. A prize to the unit which can demonstrate that it owns the most altered 1¼ ton SEV.

A thought for any ambitious junior NCO or craftsman — as pointed out in other articles from our Directorate, we need to know what you have discovered is wrong with your issued equipment, also what your suggestions are to improve the equipment of Canadian Forces systems. We believe that craftsmen should occasionally put down their wrenches and pick up their pens to complete a couple of UCRs or TFRs each year (that should help the prospect of promotion) and a submission to the Suggestion Award Programme (probably to help both financially and with promotion). Good luck!

trade advisers corner

WEAPON TECH LAND - TRADE ADVISER UPDATE

by LCol R. Langdon

A WORD ON TRADE ADVISORY COMMITTEES TAC

Currently, four Trade Advisory Committees (one for each of the LEME Trade) have been established at the direction of the Branch Adviser, DGLEM, to assist him in keeping abreast of trade concerns and problems and to recommend if possible solutions to those concerns. Neither committee has executive authority and as such can't by themselves effect changes, but by virtue of their respective collective voice, each has an important influence on what and how those solutions are implemented.

Each TAC consists of a Chairman, usually a LCol appointed by the Branch Adviser as a secondary duty; an Assistant Chairman, always a Senior Trade Representative as selected by the Chairman; selected Senior Trade Representatives from each of the commands and major units, and most importantly the Trade Career Manager. Each committee meets at least once a year to formulate recommendations, however throughout the year always maintains contact to discuss issues as they arise.

1. As the W Tech (L) Trade Adviser, I've been concerned that there was no forum in which to relate information concerning the trade to the field. Moreover I recognized the need for a medium in which you as technicians and artificers could forward your concerns about the trade to NDHQ and/or Command Headquarters. As such, I welcome the inauguration of "The Trade Advisers' Corner" in the EME Journal and strongly solicit your support to help make this information transfer medium work. In particular, I ask that you as professionals, concerned about trade development, about equipment problems, about overall morale; or about any other subject affecting the trade take the time to express those concerns to the Editor. The Editor will ensure that those concerns get passed to the responsible OPI and that you get an answer. Further, those letters and answers which affect the overall trade will be published in the "Trade Advisers' Corner" as information to all.

2. Since approximately Jan 84, I as DLAEEM 2 have had the pleasure to serve as the W Tech (L) TAC chairman and have as my able assistant CWO Mike Stevens, DLAEEM 2-2-2, and a recent appointee to the Order of Military Merit. My committee members by virtue of postings, releases etc have changed several times since Jan 84 however have always been concerned and responsible MWOs and CWOs from across the broad spectrum of the trade. (I'll publish the names of all members after APS 85). We've had two formal meetings, one in Jan 84 to discuss LORE Occupational Analysis issues, and one in Jan 85 to discuss overall trade concerns. Further, we've had major representation on the W Tech (L) Trade Specification Review Board in Feb/Mar 84 and will have similar representation on the Course Training Standard Board (CTS Board) when it sits in Apr 85 to translate trade specifications into training objectives and standards. In addition, I as Chairman had a formal opportunity in Mar 85 to meet with the Branch Adviser and his senior representatives to discuss particular trade concerns and recommendations.

3. Now to the meat of our concerns and recommendations. Training-wise, we as with other trades are making TQ6A the highest level technical trade course commonly available to all technicians. As such, much of the technical content of the 6B course will be inserted into the TQ6A course increasing the latter's overall scope. Inherent in this scope and throughout all levels W Tech (L) trade courses are increased emphasis on weapons, ammunition and hydraulic theory and an introduction to electrical and electronic theory. We've given up mobile laundry bath unit and water purification unit repair responsibilities to the vehicle trade but will retain and better train for Life Preserver Unit (LPU), safe and security containers and field stoves and lanterns trade responsibilities. TSQs on Boffin, Leopard, SP howitzers and security containers and locking devices will be retained, but the AVGP TSQ has been deleted in favour of introducing this into trades training. Because of the increased theoretical content of all courses, trade entrance requirements have been elevated to a minimum academic equivalent of Ontario grade 10 level math and physics.

4. Major trade concerns discussed included LOMMIS reporting, the need for increased Francophone training, the suitability of

females in the W Tech (L) trade. Promotion quotas and forecasts (a whole hockey sock full this year), problems with LPU maintenance, and W Tech (A)/W Tech (L) trade offs — all subjects which I hope to address in future articles. We also discussed the need for a W Tech (L) trade badge which I am happy to say has received strong support from the Branch Adviser. In this regard recommendations will be made to the Clothing and Dress Committee to have trade badges for all LEME trades as follows — one badge only for each trade (ie no demarcation for various trade levels); service green background with gold and possibly silver symbol design; and worn on lower right sleeve of CF and workdress (none on Combat). While it may take some time to receive approval for LEME trade badges, it's an important issue on which we are moving, and moving in the right direction.

5. I've more than used up my allocated space so will have to hold back other news until future issues. I remind you, though, that to keep "The Trade Advisers' Corner" a viable part of the EME Journal, your support is necessary. Please send your letters.

forty years ago

WHAT'S IN A SALUTE?

This article is reproduced from the "CAM" magazine of December 1943.

The salute is the services' own symbolic way of paying respect — like a handshake or a "Good morning". It's plain everyday courtesy in correct army style.

There are a great many versions of the origin of the salute. All of them sound more or less feasible.

In ancient Rome it was the custom of visiting military people to raise their hands, palms open, to show that they carried no lethal weapon concealed with malicious intent — and in the period when Knights wore armour, the mortality rate was high due to them not being able to recognize friend from foe with the visor of the helmet closed. Life was often dependent on a snappy raising of the visor — sort of a "don't shoot — it's me, chum" idea.

What's all this got to do with Maintenance? We suggest it has plenty. Fitters, mechanics and drivers are soldiers — a good fitter, mechanic or driver is usually a good soldier — and good soldiers can be spotted quicker than a wink

The "HI-YA BUB" type
— very chummy and informal

The "HO-HUM" type
— a beastly bore, what!

The "SUPREME EFFORT" type
— and sorry about the whole thing!

The "TELEPHONE BOOTH" type
— or "a Helicopter flies like this!"

The "C.W.A.C.-LUTE"—
usually quite regimental
— the expression depends on how
tall — dark and handsome.

by the way they salute. By the same token then, a driver's calibre can be judged by the way he salutes — it's a reflection of his whole attitude to the job.

The "Ho Hum" type will find it just as much of a bore to carry out his CPMS 1, 2 and 3 as he does to salute. "Undecided" will probably just scratch his nose instead of checking the air cleaner when he should and "Hi ya Bub" will probably do his when he feels like it, which may not coincide with operational requirements.

You know what we mean because you've seen 'smart' units — they are smart in appearance, smart on parade, their equipment is smart and efficient. It's a habit with them and they're proud of it — you can tell by the way they salute.

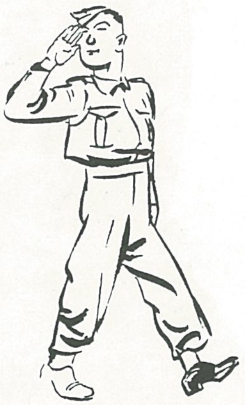
The "VIGOROUS" type
— and great exercise!

The "ORDER ME FIVE" type
— can't get rid of a pre-war beverage room habit!

The "WOOD CHOPPER" type
— or "he went that way"!

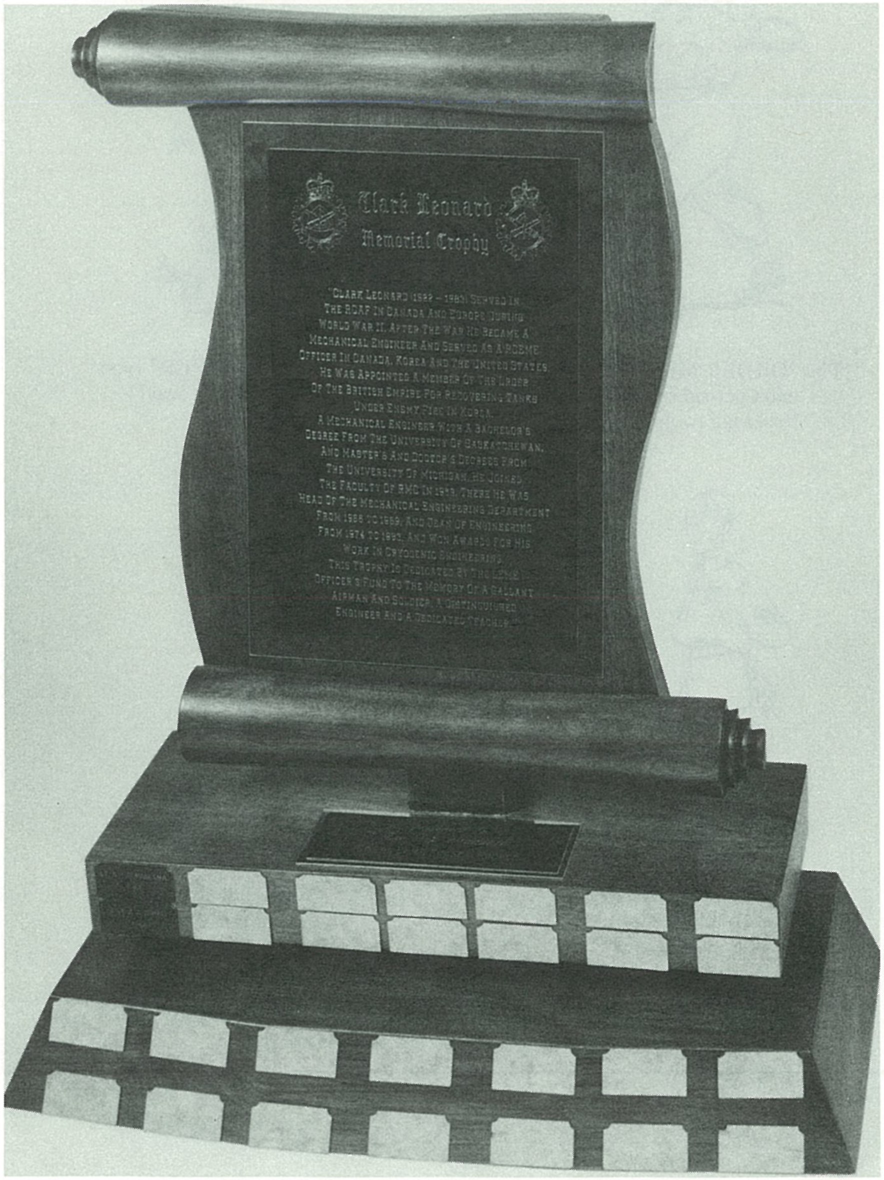
The "VIBRATTO" type
— there's spring steel in that there arm!

The "UNDECIDED" type
— will probably scratch his nose five paces later!



OF COURSE . . .
There *is* a correct way!

CLARK LEONARD MEMORIAL TROPHY


Clark Leonard
Memorial Trophy
"Clark Leonard (1922 – 1983) Served In
The RCAF In Canada And Europe During
World War II. After The War He Became A
Mechanical Engineer And Served As A RCEME
Officer In Canada, Korea And The United States.
He Was Appointed A Member Of The Order
Of The British Empire For Recovering Tanks
Under Enemy Fire In Korea.
A Mechanical Engineer With A Bachelor's
Degree From The University Of Saskatchewan,
And Master's And Doctor's Degrees From
The University Of Michigan, He Joined
The Faculty Of RMC In 1953. There He Was
Head Of The Mechanical Engineering Department
From 1955 To 1969, And Dean Of Engineering
From 1974 To 1983, And Won Awards For His
Work In Cryogenic Engineering.
This Trophy Is Dedicated By The LEME
Officer's Fund To The Memory Of A Gallant
Airman And Soldier, A Distinguished
Engineer And A Dedicated Teacher."

The Clark Leonard Memorial Trophy, awarded to the top graduate on each Phase IV Course.

Traditionally, the top student graduating from Phase IV of the LEME Officer Basic Course has been awarded a sword, emblematic of his or her achievements. In recent years, with the advent of more than one Phase IV course, the sword has been presented to the overall top student graduating during the training year.

With this development, there arose the requirement to institute a suitable award for presentation on each Phase IV course and thus continue to provide timely recognition of good performance. The Commandant CFSAOE, then Col J.I. Hanson, submitted to the Director General a proposal that a trophy in the name of Clark Leonard would be most appropriate to meet this need. With the concurrence of Mrs. Dorothea Leonard, the staff of DLES set about the task of obtaining a trophy. An original design was agreed and the trophy was completed just in time for presentation in December.

On 18 December 1984, Mrs. Leonard attended the graduation parade for 36 new LEME officers. This parade marked the end of training for the largest Phase IV course to pass through CFSAOE and as far as can be determined, the largest ever to graduate in the history of the Corps/Branch. Mrs. Leonard had graciously agreed to make the presentation of the Clark Leonard Memorial Trophy and it is perhaps fitting that it was presented for the first time to deserving graduates of a course of this size.

The course had been conducted as two serials and hence it was decided that the award would be presented in turn to the top student from each serial. The recipient of the Clark Leonard Memorial Trophy from Phase IV Course 8401 was Lt A.H. Schaafsma, a UTPM graduate from RMC and presently working at CFB Winnipeg. The top student from Course 8402 was 2Lt. A. Scott, an ROTP graduate from RMC who will shortly be proceeding to CFE on completion of his Phase III training.

The inscription on the trophy reads as follows:

"Clark Leonard (1922-1983) served in the RCAF in Canada and Europe during World War II. After the war he became a mechanical engineer and served as an RCEME officer in Canada, Korea and the United States. He was appointed a Member of the Order of the British Empire for recovering tanks under enemy fire in Korea.

A mechanical engineer with a bachelor's degree from the University of Saskatchewan, and master's and doctor's degrees from the University of Michigan, he joined the faculty of RMC in 1959. There he was Head of the Mechanical Engineering Department from 1965 to 1969, and Dean of Engineering from 1974 to 1983, and won awards for his work in cryogenic engineering.

This trophy is dedicated by the LEME Officers' Fund to the memory of a gallant airman and soldier, a distinguished engineer and a dedicated teacher."

Mrs. Dorothea Leonard presenting the Clark Leonard Memorial Trophy to Lt A.H. Schaafsma, the top Phase IV graduate of Course 8401.

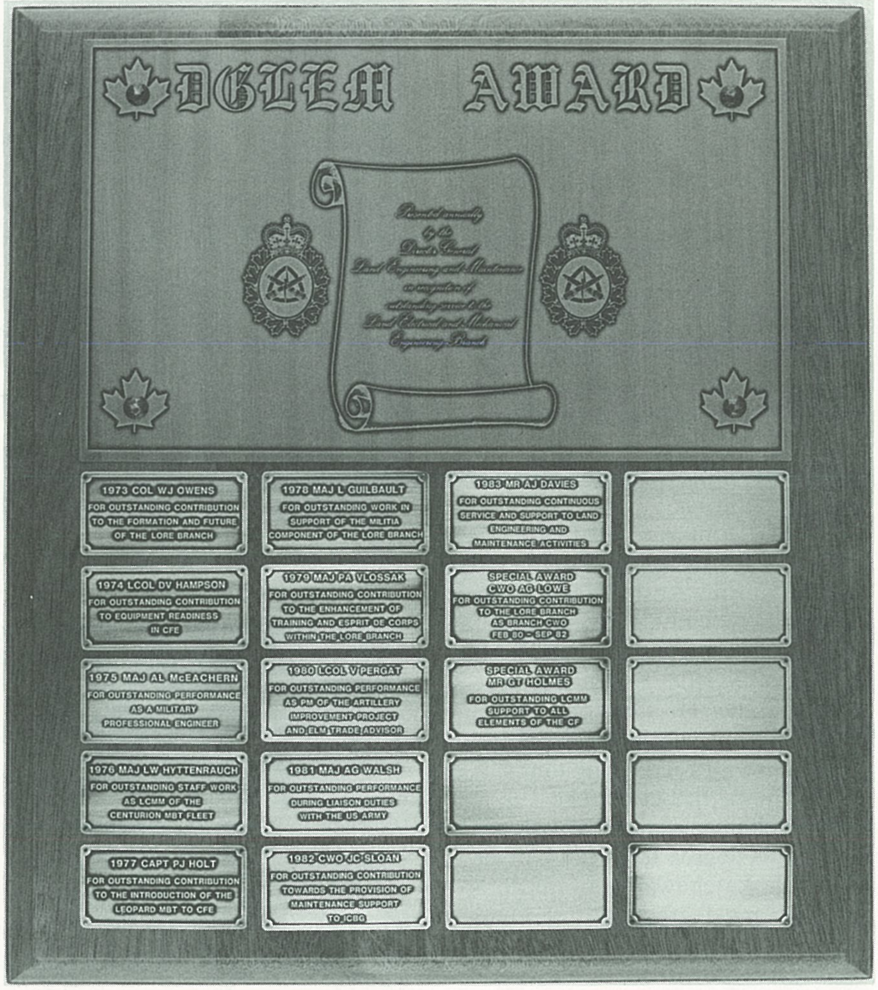
Mrs. Dorothea Leonard presenting the Clark Leonard Memorial Trophy to 2Lt A.A. Scott, the top Phase IV graduate of Course 8402.

DGLEM AWARD

DGLEM AWARD

The DGLEM Award was created in 1973 to recognize outstanding work by members of the branch.

Last year it was decided to produce a plaque on which the names of all recipients would be inscribed. The plaque is shown in the picture to the right along with the list of the Award winners since 1973.


DGLEM AWARD
1973 COL WJ OWENS
FOR OUTSTANDING CONTRIBUTION TO THE FORMATION AND FUTURE OF THE LORE BRANCH
1974 LCOL DV HAMPSON
FOR OUTSTANDING CONTRIBUTION TO EQUIPMENT READINESS IN CFE
1975 MAJ AL McEACHERN
FOR OUTSTANDING PERFORMANCE AS A MILITARY PROFESSIONAL ENGINEER
1976 MAJ LW HYTTENRAUCH
FOR OUTSTANDING STAFF WORK AS LCMM OF THE CENTURION MBT FLEET
1977 CAPT PJ HOLT
FOR OUTSTANDING CONTRIBUTION TO THE INTRODUCTION OF THE LEOPARD MBT TO CFE
1978 MAJ L GUILBAULT
FOR OUTSTANDING WORK IN SUPPORT OF THE MILITIA COMPONENT OF THE LORE BRANCH
1979 MAJ PA VLOSSAK
FOR OUTSTANDING CONTRIBUTION TO THE ENHANCEMENT OF TRAINING AND ESPRIT DE CORPS WITHIN THE LORE BRANCH
1980 LCOL V PERGAT
FOR OUTSTANDING PERFORMANCE AS PM OF THE ARTILLERY IMPROVEMENT PROJECT AND ELM TRADE ADVISOR
1981 MAJ AG WALSH
FOR OUTSTANDING PERFORMANCE DURING LIAISON DUTIES WITH THE US ARMY
1982 CWO JC SLOAN
FOR OUTSTANDING CONTRIBUTION TOWARDS THE PROVISION OF MAINTENANCE SUPPORT TO 1CBG
1983 MR AJ DAVIES
FOR OUTSTANDING CONTINUOUS SERVICE AND SUPPORT TO LAND ENGINEERING AND MAINTENANCE ACTIVITIES
SPECIAL AWARD CWO AG LOWE
FOR OUTSTANDING CONTRIBUTION TO THE LORE BRANCH AS BRANCH CWO FEB 80 - SEP 82
SPECIAL AWARD MR GT HOLMES
FOR OUTSTANDING LCMM SUPPORT TO ALL ELEMENTS OF THE CF

1973 — Col WJ Owens, for his outstanding contribution to the formation, development and future of the LORE branch.

1974 — LCol DV Hampson, for his outstanding contribution to the equipment readiness of the Canadian Forces in Europe.

1975 — Maj AL McEachern, for his outstanding performance as a military professional engineer.

1976 — Maj LW Hyttenrauch, for his outstanding staff work as Life Cycle Materiel Manager of the Centurion Tank Fleet.

1977 — Capt PJ Holt, for his outstanding contribution to the introduction of the Leopard tank in Canadian Forces Europe.

1978 — Maj L Guilbault, for his outstanding work in support of the militia component of the LORE branch.

1979 — Maj PA Vlossak, for his outstanding contribution to the enhancement of training and esprit de corps within the LORE branch.

1980 — LCol V Pergat, for his outstanding staff work as manager of the Artillery Improvement Project and for his contribution to the LORE branch as Adviser for the ELM Trade.

1981 — Maj AG Walsh, for his outstanding performance during liaison duties with the United States Army.

1982 — CWO JC Sloan, for his outstanding contribution in providing maintenance support to units of 1 Canadian Brigade Group.

1983 — Mr JA Davies, for his outstanding continuous service and support to Land Engineering and Maintenance activities.

1984 — Sgt HW Munroe, for his outstanding dedication and performance in providing maintenance support to the militia.

SPECIAL AWARDS

CWO AG Lowe, for his outstanding contribution to the LORE branch while branch CWO, Feb 80 to Sept 82.

Mr GT Holmes, for his outstanding contribution in providing Life Cycle Materiel Management for all elements of the Canadian Forces.

The 1984 recipient of the DGLEM Award, Sgt HW Munroe receives a commemorative plaque from DGLEM BGen JGR Doucet.

PRESENTATION TO CFOCS OFFICER CANDIDATES' MESS

From left to right: 2nd Row. Capt Logan, Capt. Kelly, Capt. Ether, Capt. Hamilton, Lt. Duffenais, Capt. Allot 1st Row: Lt. Lebrun, Lt. Carignan Capt. Myers, Maj. Dunsmore, L.Col. Neugebauer, Mr. Buckingham (D ceremonial),

On 19 Mar 85 the LEME officers of CFB Chilliwack, 1 CER and CFR candidates at CFOCS presented a pair of pictures to the PMC of "The Gunroom", the Officer Candidates Mess at CFOCS. The presentation was made on behalf of the LEME Officers' Fund and completes a display package that included a LEME flag and plaque that had been previously donated in May 84.

The pictures are enlarged photographs of two recovery scenes taken on 6 Sep 51 in Korea. The first picture shows RCEME technicians taking a hoist winch cable to a disabled half-track in the middle of the swollen Imjin River.

The second is a close-up view of the same half-track being pulled out of the water.

The items are prominently displayed within the Gunroom and will aid future officer candidates in identifying with the LEME Branch at an early stage of their career.

THE QUEEN'S SHIELD

Coat-of-Arms that was affixed to the shield

The organizers of the Queen's visit to Canada needed someone to design and build a shield and attaching device to allow the Queen's coat of arms, plus the Royal Standard, to be mounted on the cars she would be riding in. Since this was the first time they would be used in Canada, only a design provided by the British was available.

The organizers turned to 202 Workshop Depot for help. The request was received in late May with the Queen's visit planned for early July. Mr. Marcel Vidal from the Engineering Services Division took charge of the project.

The project had two distinct and important divisions. The first involved the production of a three dimensional model of the Royal coat of arms, working from a design in cardboard. Mr. Marcel Delisle, the supervisor of the Instrument Shop took charge of this task. Because he was attending a course at the same time, he worked evenings and weekends to produce the mold. As the first was too fragile, Mr. Delisle was forced to produce a second. This one was strong enough and eight casts were made. Each had to be hand painted, a job done by Miss Carole Robinson of the Paint Shop.

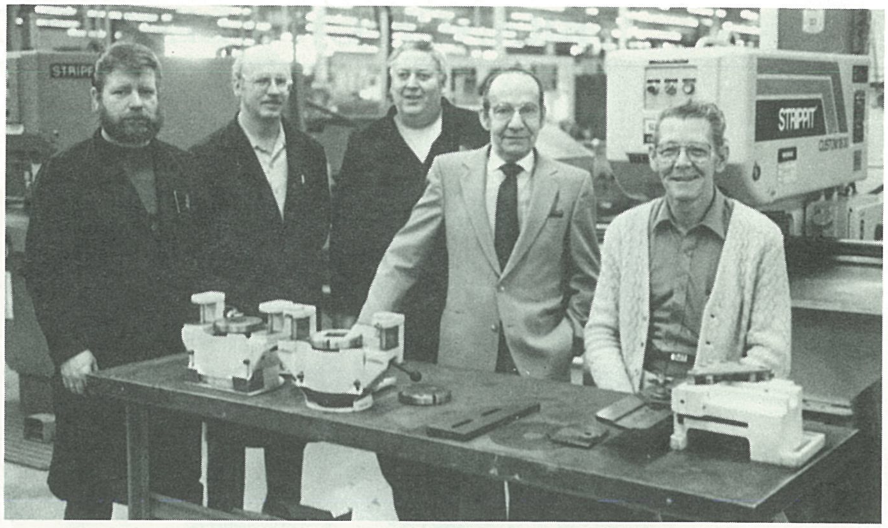
The second facet of the project involved the design of the attaching mechanism to hold the coat of arms and the Royal Standard on the roof of the car, but without damaging anything. In addition the device had to be easily carried and simple to install and remove.

The design provided by the British called for holes to be drilled in the roof of the car. As this was clearly unacceptable, a new design had to be thought up. Mr. Vidal and Mr. Pelletier, a craftsman working for the Engineering Services Division, worked on the design. In all, three designs were produced. The first was not acceptable for various mechanical and aesthetic reasons. The second, while not perfect was put in production because of the short time till the visit in July.

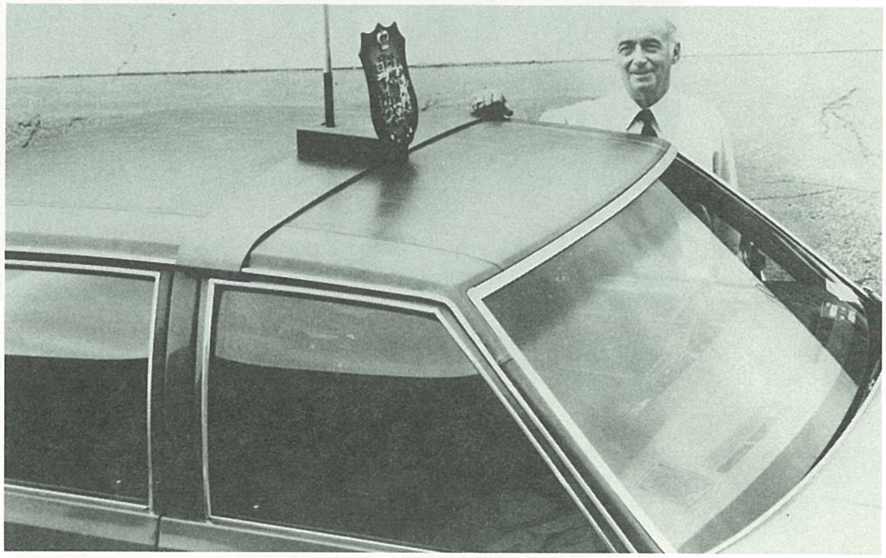
When the July visit was postponed, more modifications were made and the third prototype produced.

The production models were made by the Sheet Metal Shop consisting of Mr. A. Brideau, Mr. F. Dillon and Mr. G. Gravel, and supervised by Mr. Desrochers. In all, the shop made two sets of eight, in each case working under time pressure to produce them before the deadline.

When the Queen's visit happened in September 84, the shield and mounting hardware performed flawlessly and are now in storage in the Directorate of Ceremonial in preparation for the next visit of the Queen. A product of regal quality resulting from the high standards of professional, technical and innovative craftmanship applied in 202 Workshop Depot.



The main participants in the project to produce the shield.
From left to right: Mr. Alfred Brideau, Mr. Guy Gravel, Mr. Frank Dillon,
Mr. Marcel Delisle, Mr. Maurice Desrochers,
Absent: Mr. Benoit Pelletier, Mr. Marcel Vidal, Miss Carole Robinson,



Mr. Benoit Pelletier with the finished product attached to the roof of a car.

BRANCH CWO LEAVES OFFICE

After three years as Branch CWO, CWO TD Jones is off to B Maintenance CFB Chilliwack. He was recently presented with the replica of LEME Branch Cane of Office by DGLEM B Gen JGR Doucet.

IN MEMORIAM

Major Norm Austin, who died at his home in Castlegar, B.C., after a long battle with cancer on 29 March 1985. A military funeral was held with the assistance of personnel from Base Maintenance from CFB Chilliwack.

Sergeant Merl Huber, who passed away at NDMC on 14 April 1985 of cancer.

Mr. Gord Allan, who died at NDMC on 10 February 1985 of cancer. Gord had retired from the Canadian Forces and for the past years had been hired on contract to work for DLES on various publications. More particularly, Gord had done extensive work on the production of the LORE Tech Bulletin and on the first edition of the EME Journal.

sports corner

Eastern LEME Bonspiel CFB Gagetown "A" Event Winners Left to Right Capt Brian Kelly, Skip Martial Gauthier, 3rd Gary Logan, 2nd Murray McClafferty & Lead Bill Pronyk

18th Annual CFE LEME Bonspiel - LAHR 8-10 Feb. 85 Winners Left to right WO Doug Purdy WPNS TECH RCD MCpl Carl Sepper METALS TECH RCD BGen J.G.R. Doucet MCpl Ray Gill WPNS TECH RCD Cpl Jeff Knight WPNS TECH RCD

Western LEME Bonspiel CFB Penhold BGen Doucet handing the trophy to the A event winners Al Price, Danny Kuzmich, Rick Laycock, Lorena Hart.

Bonspiel du GEM de l'ouest BFC Penhold
Le Bgen Doucet remettant le trophée à l'équipe gagnante
Al Price, Danny Kuzmich, Rick Laycock, Lorena Hart.